THE

AMERICAN GAS-LIGHT JOURNAL.

THE OFFICIAL GAZETTE OF

LIGHT, HEAT, WATER-SUPPLY, AND SEWERAGE.

Rooms—No. 39 Nassau Street, cor. Liberty Street, opposite the Post-Office, New York.

LONDON:—TRUBNER & CO., No. 60 PATERNOSTER ROW.

VOL. III.—No. 58. NEW-YORK, THURSDAY, MAY 15, 1862. $3 PER ANNUM.

HERRING'S PATENT

Champion Fire-Proof Safes.

Herring's Champion Burglar-Proof Safes, with Herring & Floyd's New Patent Crystalized Iron, the only metal which cannot be drilled.

Nearly 25,000 Herring's Safes have been made and sold, and over 500 have passed triumphantly through accidental Fires, thus fully sustaining their acknowledged and well-earned character as the "best Fire-Proof Safes the world ever saw."

Herring's New Patent Burglar-Proof Safes, made of a combination of Wrought Iron, Patent Crystalized Iron, and Bars of Steel, are confidently offered to the public as the strongest and best security against skilful burglars now extant.

It was a "Herring's Burglar-Proof Safe," the public will remember, which so lately held secure its trust against the determined ingenuity of the boldest and greatest mechanical burglars this country has ever known, and saved for the New York Exchange Bank no less than

HALF A MILLION OF DOLLARS.

Herring's Patent Fire and Burglar-Proof Safes *combined*, (one Safe within another,) making the most perfect protection from fire and thieves now known.

FIVE OF HERRING'S SAFES VICTORIOUS!

WELLSBORO', Penn., December 21, 1861.

Messrs. Herring & Co., New York:

Gentlemen,—At the great fire which occurred here on the 18th December last, my store, with a number of other buildings, was entirely destroyed; no less than seven places of business were burnt out and five of your safes severely tested, in every instance saving their entire contents, to the complete and perfect satisfaction of the owners. Two of your Herring's Patent Champion Safes which were in my building remained there through the entire conflagration, and were not opened until the day after the fire. No water was thrown on the building. Everything in my safe after the fire was nearly as good as new. C. L. Wilcox also preserved all his books, papers, and money in two of your safes, both being in same fire. Wm. Roberts was also the fortunate owner of another of your Patent Champion Safes, which was severely tested, and saved completely his books, papers, and money. The result has given great satisfaction, and we want no safe but Herring's Champion. Please send me one same size I last bought of you immediately. Send by N. Y. & Erie R.R. via Tioga depot. JOHN R. BOWEN.

I had two of Herring's Safes in above fire. They saved my books, papers, and $2,000 *in bank bills.* C. L. WILCOX.

HERRING'S PATENT CHAMPION saved my books, papers, and about $400 in *paper money.* I would use no other. WILLIAM ROBERTS.

GREAT FIRE IN PEARL AND FULTON STS.

NEW YORK, Jan. 27, 1862.

Messrs. HERRING & Co., No. 251 Broadway:

Gentlemen,—The large HERRING'S PATENT CHAMPION SAFE you made for me a few years ago has been put to a severe test in the great fire corner Fulton and Pearl sts., on the 26th inst., which entirely destroyed my building, together with many others.

The fire commenced about 6 o'clock on Sunday morning, and the safe was taken from the ruins after an exposure of more than thirty hours.

Your Safe contained all my books, insurance policies, and other valuable papers besides, gold and silver, bank bills, coupon bonds, &c., amounting to over Two Hundred Thousand Dollars. Everything in the Safe is in perfect order, except the binding of the books being steamed.

Your Patent Champion Safe gives us great satisfaction, and has guarded safely through the fire every dollar of its contents.

Truly yours, A. S. FOSTER.

GREAT FIRE IN NEW JERSEY.

NEW BRUNSWICK, N. J., January 18th, 1862.

Messrs. HERRING & Co.,

No. 251 Broadway, New York:

Gentlemen,—At the recent extensive fire in our city, on Wednesday morning last, 15th inst., I was the fortunate owner of one of your HERRING'S PATENT CHAMPION SAFES, which contained some books and a number of valuable papers.

The heat in my store was very great, and the safe subject to an intense heat. I felt great interest in the safety of my papers, as a number of castings in my store and within a few feet of the safe were melted. Nothing, indeed, was saved in my building, except the contents of your safe, which I am happy to inform you was completely preserved, after a thorough roasting for some seventeen hours. The result has exceeded my anticipations, and fully confirmed my confidence in the security of your Herring's Patent Safe. Please send me another of larger size, and refer all incredulous to my books and papers, which it gives me great pleasure to show.

WM. H. ARMSTRONG.

Herring & Co., 251 Broadway.
Farrel, Herring & Co., Phila.
Herring & Co., Chicago.

IRON FOUNDRIES.

BERGEN IRON WORKS, Established 1833.

R. A. BRICK, Manufacturer of CAST IRON WATER and GAS-PIPES. RETORTS, PIPES, &c., always on hand. Office, 109 Leonard Street, New York.

S. V. MERRICK, J. VAUGHAN MERRICK, W. H. MERRICK.

SOUTHWARK FOUNDRY, Philadelphia.

MERRICK & SONS, Engineers, Manufacturers of every description of Gas Machinery.

Retorts, Bench Castings, Condensers, Washers, Scrubbers, Wet or Dry Lime Purifiers, Coke Wagons, Fire Tools, Wrought Iron Grate Bars, Gasholders, either TELESCOPIC OR SINGLE, WITH SUSPENSION FRAMES COMPLETE; Wrought Iron Roof Frames, for Iron or Slate; Stop Cocks, Exhausters, Steam Pumps, Boilers and Tanks, Steam or Hand Air Pumps for proving Street Mains, Centre Seals, Governors, Wrought or Cast-Iron Lime Sieves for Purifiers, Purifier Hoisting Machines, &c., &c.

Address— MERRICK & SONS, 5th and Washington Streets, Philadelphia.

OREGON FOUNDRY, Nos. 740, 742, 744 Greenwich Street, New York.

HERRING & FLOYD, proprietors, manufacture Gas Compensators of all sizes, Self-Acting Valves, Exhausters upon an improved plan, costing less than half those of English manufacture, also castings of every description for Gas and Water Works.

Herring & Floyd offer for sale Sabbaton's Patent Screening Shovels for coke and coals, made of malleable iron, of all sizes; Sabbaton's Patent Improved Cast Iron Furnace Frame and Door, arranged to protect the iron work of the door and frame from direct contact with the fire; also, Floyd's Patent Malleable Iron Retort Covers, only quarter of an inch thick, but of convex form, and of great strength, as is attested by certificates from several of the leading Gas-works in America. For engravings of all the above patents see AMERICAN GAS-LIGHT JOURNAL for October, 1859, pages 65 and 71.

Samples of the above castings can be seen at the Rooms of the AMERICAN GAS-LIGHT JOURNAL.

S. FULTON & CO., (Successors to Colwell & Co.) Manufacturers of Pig Iron and Cast Iron Gas and Water Pipes, also Heavy and Light Castings of every description, No. 207 North Water street and 206 North Wharves, Philadelphia.

SAMUEL FULTON, THEO. TREWENDT.

TRAINER & MERCER, 117 NORTH Water Street, & 124 North Wharves, Philadelphia, AGENTS FOR THE MERCER FOUNDRY, AND ELK SHEET IRON WORKS.

CAST IRON STREET MAINS; *Bends, Branches, Chemical Retorts, and all kinds of Castings for* GAS-WORKS, either COAL or ROSIN WORKS. SHEET IRON FOR GASOMETERS *cut and punched to order.* BOILER IRON *of all descriptions.* RUSSIA SHEET IRON, TIN PLATES, BLOCK TIN, COPPER, PIG LEAD, SPELTER, and Metals generally.

FLORENCE IRON WORKS.—The subscriber is prepared to execute orders and make contracts for Cast-Iron Water and Gas-Pipes, from 2 inches to 48 inches in diameter; also, Retorts, Bench-Castings, Branches, Bends, and all Castings for Water or Gas-Works. Pipes and Castings coated with Smith's Patent Coal Tar Varnish to prevent corrosion.

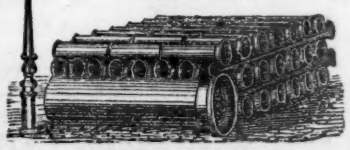
JOSEPH G. JONES, 205½ Walnut Street, Philadelphia.

R. D. WOOD & CO.,

MANUFACTURERS OF

CAST-IRON PIPE, RETORTS, &c.

Office, 400 Chestnut Street, PHILADELPHIA.



TO GAS AND WATER COMPANIES:

The undersigned, Agent for Messrs. Thomas Edington & Sons, Phenix Foundry, Glasgow, Scotland, is prepared to contract for all descriptions of Cast-Iron Pipes of their manufacture.

About 6,000 tons of these Pipes have lately been supplied to the Brooklyn Water-works, N. Y., and the Chief Engineer of the Works, A. P. Kirkwood, Esq., is ready to testify to their excellent quality.

ARCH'LD BAXTER, 28 Beaver St., N. Y.

Sole Agent for the United States and Canada.

IRON FOUNDRIES.

MORRIS, TASKER & CO., PASCAL IRON WORKS,

[ESTABLISHED 1821.]

PHILADELPHIA, manufacture Wrought Iron Welded Tubes for Gas, Steam or Water; Lap-Welded Boiler Flues,

GALVANIZED WROUGHT IRON TUBES,

ARTESIAN WELL PIPES,

of Wrought or Cast-Iron, screwed together, flush inside and out; Gas-works Castings, Retorts and Bench Castings for Coal Gas-works,; Cast-Iron Street Mains, Bends, Branches, Drips, &c.

GAS AND STEAM FITTERS' TOOLS, &c.

STEPHEN MORRIS, CHAS. WHEELER,
THOMAS S. TASKER, STEPHEN P. M. TASKER.

CAST IRON WATER, GAS, DRAIN AND HEATER PIPES, &c.,

COLUMBIAN IRON WORKS,

OFFICE, No. 46 NORTH SEVENTH STREET, Below Arch Street, Philadelphia.

THOS. M. ADAMS, Proprietor.

S. S. ASHCRAFT, CINCINNATI, O., Manufacturer of Gas and Water-Pipes, with Branches of every description; Retorts for Gas and Oil Works; Gasholder Stands, Columns, &c.; Gas Purifiers, Condensers, and Gas Apparatus of all kinds; Foundry Work in general.

N. B.—A complete selection of Patterns on hand. Refer to any of the Gas-Works in the Western and Southwestern States.

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JOHN JEFFREY, Civil Engineer, Cincinnati.
JACOB HOUGHTON, Engineer, Detroit.

WARREN FOUNDRY AND MACHINE CO., Phillipsburg, N. J. Manufacturers of Cast-Iron Pipes, from 2 to 48 inch diameter, all pipes from 3 inch to 48 inch cast vertically, and in dry sand, in lengths of 12 feet. 2 inch pipes in lengths of 7 feet. Special Castings of all descriptions furnished at short notice.

REFERENCES.

Croton Aqueduct dept., N. Y.
Manhattan Gas Lt. Co., N. Y.
Brooklyn Water dept., N. Y.
Brooklyn Gas Lt. Co., N. Y.
Citizens' Gas Lt. Co., Brooklyn, N. Y.

CAST IRON PIPES.—EARL'S IRON WORKS, NEWARK, N. J., 91, 93, 95, 97 and 99 Chestnut Street. Branch Office, 21 Centre street, New York.

The subscriber continues to manufacture Superior Cast-Iron Gas and Water Pipes, Branches, Bends, Angles, Bevel Hubs, Reduces, Sleeves, Drip Syphons, Plugs, Caps, Retorts, Bench Castings, and Castings in general. Particular attention paid to all Castings connected with Gas-Works. E. B. EARL.

PORTABLE GAS-WORKS.

STRATTON & BROTHER'S PATENT GAS-WORKS, for making Gas from ROSIN or COAL OILS. STRATTON'S Patent Double Retort, for Coal, Wood, or Rosin.

Our Patent Gas Works have been put up in some forty Country Residences, Factories, Churches, &c., in which an experience of *ten years* gives entire satisfaction.

Water Works also put up in country residences. All work warranted.

Reference—Prof. JAS. C. BOOTH, U.S. Mint, Phila.
CHRISTOPHER FALLON, "
STRATTON & BROTHER, 719 Walnut street, Philadelphia.

BUTLER'S PATENT PORTABLE ROSIN GAS-WORKS,

FOR

Dwellings, Churches, Country Villages,

As well as for Consumers in Large Cities.

JOHN BUTLER, No. 112 Fulton st. and 15 Henry st., Brooklyn, N. Y.

FOR LIGHTING RAILROAD CARS AND STEAMBOATS

WITH GAS.

The whole process of Filling the Gas-Holders of a Railway Train, requires but Three Minutes.

Apply to NEW YORK CAR & STEAMBOAT GAS. CO., No. 117 Fulton st., N. Y.

C. R. WOODWORTH, Manufacturer of

PORTABLE GAS WORKS,

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COAL-OIL & CANDLES.

THE LUTHER ATWOOD OIL COMPANY'S

DEODERIZED

ILLUMINATING OIL,

Unsurpassed by any KEROSENE manufactured. Is nearly COLORLESS, of a PLEASANT ODOR, and burns without smoke, or crusting the wick. WARRANTED NON-EXPLOSIVE.

For sale in any quantity at a greatly reduced price.

Packed in cans and cases for foreign markets. Apply to U. TALLMAN, 34 Burling Slip, New York.

COAL OIL! COAL OIL!! of the celebrated brand of "SILVER SPRING." A superior burning oil, white, pure, safe, and odorless.

J. S. STANTON, Manufacturer, No. 132 Maiden Lane.

A LAMP CHIMNEY THAT WILL not break.—Made for the million.

The patent Mica Chimneys for coal-oil Lamps possess many advantages over the glass chimneys. They do not break from the heat, falling, cleaning, or any ordinary usage. When one is purchased it will last, with care, as long as the lamp. They fit all the burners now in use.

AMOS HORNING, Agent for Manufacturer, No. 321 North Second st., Philadelphia.

N. B.—Coal-Oil Lamps and Coal-Oil at low rates.

PATENTED OCT. 8, 1861.

Dithridge's Patent

OVAL LAMP CHIMNIES,

for Coal-Oil burners. Manufactured of

XX FLINT GLASS.

These chimnies are intended for the flat flame which, heating all parts of the glass equally, does not expose it to cracking.

E. D. DITHRIDGE, Fort PittGlass Works, Pittsburg, Pa.

THE LOVERS' LAMPS.—Price Five Shillings ($1.25) each. To supersede Candles and Night Lights. No Dressing or Trimming required.

EDMUND SPILLER, Patentee, 98 HOLBORN-HILL, LONDON. Post-Office orders attended to.

Ambrose's

PATENT

COAL-OIL, NO-CHIMNEY BURNER,

For Portable LAMPS, LANTERNS, Etc. Requires no Chimney.

Address, J. E. AMBROSE, 249 Pearl st., New York, or 45 Newark Av., Jersey City, N. J.

COAL OIL, FOR BURNING.—FINE quality, 40 to 50 cents per gallon, according to quantities. Dealers and consumers can obtain it at the above rates of XAVIER GEX, coal-oil refiner, 75 William street.

AGENTS.—TO ALL WHO USE Candles.—The Candle Lamp just out. Safety and economy in light. No excuse for using explosive fluids. No dropping of tallow on carpets. The Candle Lamp will be sent free on receipt of 25 cents. Agents, male and female, can make a larger profit, and find a quicker sale for the Candle Lamp, than any article yet offered to the public. Send red stamp for illustrated circular.

WM. SUMNER, 208 Broadway, (room No. 10,) N. Y. city.

PATENT BITUMINIZED PIPES,

For the Conveyance of Water, Gas, and Drainage.

This important invention, patented by Mr. Charles Newbold, and now for the first time introduced to the public, may confidently be stated to be one of the greatest interest and commercial value, as the Patent Bituminized Pipes possess all the qualities necessary for the conveyance of Water, Gas, Sewage, Mine-Pumps, &c., viz.: great strength, great durability, and inoxidability, with the immense advantage of being about *one fifth* the weight of iron pipes, and about 35 per cent. cheaper; whilst, compared with lead pipes, the Bituminized Pipes are only about *one fourth* their price, without the possibility of the formation of the oxide and carbonate of lead, so dangerous for every purpose. They will stand 150 degrees of Heat, and after many trials it has been satisfactorily proved that rats or vermin will not touch them. They also withstand the action of all acids and salts.

Iron pipes are at present frequently covered with a coating of bitumen or coal tar before they are laid down; but the adherence of this coating to the metal being very imperfect, on account of vibration and the difference of expansion, this preservation is insufficient, besides being exposed to a number of influences which neutralize its efficacy—galvanic currents materially assist the formation of oxides and deposits, which cause the obstruction and eventually the destruction of metallic pipes.

The Patent Bituminized Pipes are neutral, non-conductors of electricity, and consequently are not exposed to any of the deteriorating influences mentioned above. The process of manufacture of these Pipes consist in causing a roll of paper to pass through a reservoir of melted bitumen, after which it is tightly coiled around a mandril to any required thickness; and thus, when hardened, a tube is formed of perfect texture, great hardness, and enormous strength. These Pipes are proved, by hydraulic pressure, to resist a pressure of 220 lbs. to the square inch, equal to 506 feet head of water, which is more than double the altitude of the highest reservoir. The bituminous composition which unites and covers these Pipes is so well known as an excellent preservative, that it will be unnecessary to demonstrate that, when laid underground, the durability of the Patent Bituminized Pipes may be considered as unlimited. The Pipes are made in lengths of seven feet, and are connected by socket joints of the same material as the Pipes; or they can be fitted with iron flanged sockets, screwed together in a most simple and inexpensive manner.

For Gas these Pipes are invaluable; the Gas-lining which we insert effectualy resists the action of Gas, and being non-conductors, there can be no condensation in them, and the joints made with the Patent Cement are so strong as to entirely prevent Leakage.

The cost of laying the Pipe is also small, compared with those of iron, and can be done by mere laborers. The Bituminized Pipes have been in use the last three years, for the conveyance of gas and have been ascertained to be as perfect now as when first laid down.

DIRECTIONS FOR JOINING THE PATENT BITUMINIZED PIPES.

Pack the pipes level in the ordinary way; slip the collar over one of the pipes; draw the ends close together and warm them by putting a hot iron between them; then press them together so as to make them adhere; take a piece of iron wire netting, about half an inch in the mesh, a little narrower than the length of the collar, and long enough to wrap once round the pipe, spread the collar over it and the joining; close the ends with clay; pour the melted cement into the manhole of the collar, and fill up the interior space; then remove the clay and the joint is finished.

It is necessary to leave a small vent hole in the clay at each end of the collar to allow the air to escape as the cement is poured in, that there may be no flaws or air bubles in it when cold. If in cooling the cement settles in the manhole, fill up again.

N. B.—The cement should be broken into small pieces and melted in a pot as you do lead, at a low temperature, until it is dissolved; it must be stirred while melting; then take it off and keep stiring it as it cools until it becomes nearly as liquid as water; then pour quickly.

All Orders should be addressed to

THE AMERICAN BITUMINIZED PIPE COMPANY,
OFFICE 24 WATER STREET, BOSTON, MASS.,
J. McGEARY, AGENT;

or to FREDERICK W. BOND,
SOLE AGENT FOR NEW YORK,
58 LIBERTY STREET, (Between Broadway and Nassau Streets,) **NEW YORK.**

Cement for Joining, For Sale as above.

GAS-COAL.

LIVERPOOL AND NEWCASTLE **CANNEL & COAL,**
FOR
Gas-Manufacturers and House Use.
The careful shipment of the best qualities, of Cannel and Coal, at the lowest rates current at the time of engagement guaranteed.
T. W. PARMELE, Agt.,
No. 4 Irving Place, New York.

"PEASLEY CROSS" SUPERIOR HOUSE CANNEL.—The undersigned is receiving regular supplies of the above well-known and choice Cannel, selected carefully, for sale, ex ship or from store, in lots to suit purchasers, on reasonable terms.
Dealers can be supplied by lighters, at their yards, from ships Vanguard and New World, now discharging, and from other vessels to arrive.
Apply to RICHARD THACKRAY,
No. 44 Exchange Place.

F. BUTTS & CO. (Successors to BUTTS & KENDALL),
DEALERS IN THE CELEBATED
Sterling Coal
Pittsburgh and other Gas Coals,
P. O. DRAWER, 74,
CLEVELAND, OHIO.

ANTI-FREEZING APPARATUS.

FREEZING OF GAS-PIPES.—Walton's Patent Anti-Freezing Apparatus illustrated by Engravings in the AMERICAN GAS-LIGHT JOURNAL, of Jan. 1, 1861, page 212, is the most simple, durable and efficient of any known process.
See also certificates from Cincinnati, O., and Louisville, Ky. Gas-Works in same number, page
Address, JOHN WALTON,
Sup't Gas-Works, Louisville, Ky

GAS-METER FLUID.

FLUID FOR GAS-METERS.—The undersigned is prepared to furnish the Glycerine Meter Fluid in quantities to suit purchasers. *It does not evaporate, can be made to stand any degree of cold liable to occur in this country or in Canada, and does not corrode the metals of the meter. It has been in use successfully for the last three years.*
For particulars, references, &c., address the manufacturer, HENRY BOWER,
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GAS AND WATER-PIPE.

W. & J. GRIFFITHS & CO.—City Tube Works, Malleable Iron and Brass Foundry, No. 27 North Seventh street, Philadelphia. Manufacturers of Wrought Iron Pipe, Lap-Welded Flues and Fittings; also, Brass Work of all descriptions, for Gas, Steam and Water. Particular attention given to Heating Buildings, &c.

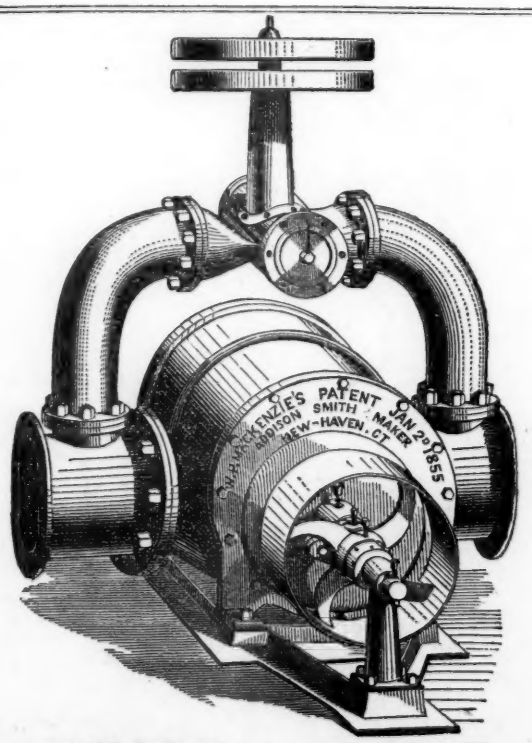
CAST AND WROUGHT IRON Pipe, Branches, Elbows, Sleeves, &c. Lamp-Posts, Wrought-Iron Lanterns for Lamp-Posts, Gas Retorts (clay or iron), Street Mains in 9 or 12 feet lengths. Sheet-Iron cut to pattern for Gas-holders. For sale by the Manufacturers' Agent,
HENRY G. NICHOLS, 24 Pine st., N. Y.

HUNTER, KELLER & CO., Manufacturers of
WROUGHT-IRON PIPES & FIXTURES,
of all descriptions, for
STEAM, WATER AND GAS.
144 Centre street, New York.

GIRARD TUBE WORKS—MURPHY & ALLISON, Proprietors. Wrought Iron Coke-Welded Tubes, for Gas, Water, Steam, &c. Wrought, Cast and Malleable Iron Fittings, Steam and Gas Cocks, Valves. Also, Galvanized Tubes and Fittings.
Office 1908 Market street, Philadelphia.

PATENT BITUMENIZED PIPES for Water, Gas, and Drainage.—These pipes possess all the properties necessary for the conveyance of Gas, Water, and also for Drainage purposes, viz., great strength, great durability, and perfect inoxidability; and being non-conductors are not affected by frost, like metal pipes; they are proved to resist a pressure of 220 lbs. on the square inch (equal to 500-ft. head of water), and can be made up to any greater strength if required. They are only one-fourth the weight, and when laid down are fifty per cent. cheaper than iron pipes; they are made in 7 ft. lengths, and the joinings are simple and inexpensive.
These Pipes have been in use nearly three years, and have given the most perfect satisfaction.
Further particulars as to joining, &c., and specimen pipes, may be obtained by addressing
FREDERICK W. BOND,
58 Liberty street, New York.

NEWSPAPER WRAPPERS. Mara's Patent Self-Sealing and Folding Water-lined Newspaper Wrappers, $1.50 per 1000. Sold by
F. W. BOND,
Sole Agent for the Patentee,
58 Liberty st., New York.



SMITH & SAYRE,
Sole Proprietors and Manufacturers of
THE MACKENZIE PATENT GAS EXHAUSTER
AND
PATENT COMPENSATOR.

They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-joints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.
We are also sole proprietors and manufacturers of the
MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.
The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary Fan. The Cupolas are manufactured in sizes to melt from 1 ton to 20 tons per hour, will save one quarter of the time required by the old style Cupola, and 33 per cent. fuel. Address SMITH & SAYRE, 458 Broadway, New York.

WHERE GAS-WORKS AND WATER-WORKS ARE WANTED.

We are now publishing regularly the names of the thirty thousand post-towns in the United States, so that builders of gas-works and water-works, and the various manufacturers, may see where are new openings for business. And as each post-master will receive several copies of the AMERICAN GAS-LIGHT JOURNAL, for distribution, the number thus circulated will probably exceed *Three Million Copies. What a chance for advertisers!*

POST-OFFICE TOWNS IN THE UNITED STATES,

ARRANGED BY STATES AND COUNTIES,

Showing where Gas-Works and Water-Works are Wanted.

PENNSYLVANIA.

65 Counties, 2,364 Towns, 31 Gas-Works, 15 Water-Works.

(*Concluded from page* 323.)

Pike County.

Blue Eddy,	Lackawaxen,	Narrows,
Bushkill,	Lord's Valley,	Nyces,
Delaware.	Masthope,	Paupac,
Dingman's Ferry,	Matamoras,	Shehola,
Egypt Mills,	*Milford*, (c. h.,)	Tafton,
Fulmerville,		Westfall.

Potter County.

Ayer's Hill,	Eulalia,	Pike Mills,
Bingham,	Genesee Fork,	Pike Valley,
Brookland,	Germania,	Raymond's,
Burtville,	Harrison Valley,	Roulette,
Carter Camp,	Hebron,	Sharon Centre,
Clara,	Hector,	Singlehouses,
Colesburgh,	Homer,	Sweden,
Cowdersport, (c. h.,)	Kettle Creek,	Turner Creek,
Cross Forks,	Lymansville,	Ulysses,
Donnally,	Mill Port,	Ulysses Centre,
East Homer,	Nelsonport,	West Pike,
East Sharon,	North Wharton,	Wharton,
Eleven Mile,	Oswayo,	White's Corners,
Ellisburgh,		Williston.

Schuylkill County.

Ashland,	Hepler,	Pottsville,
Auburn,	Hughes,	Ringtown,
Barry,	Klingerstown,	Rough and Ready,
Bearmont,	Landingville,	Sacramento,
Branch Dale,	Llewellyn,	Saint Clair,
Broad Mountain,	Lower Mahantango,	Schuylkill Haven,
Cressona,	McKeansburgh,	Silver Creek,
Donaldson,	Middleport,	Summit Station,
Elwood,	Minersville,	Swatara,
Focht's Forge,	North Penn,	Tamaqua,
Friedensburgh,	*Orwigsburgh*, (c. h.,)	Tremont,
Gordon,	Pine Grove,	Tuscarora,
Hecksherville,	Pitman,	Upper Mahantango,
Hegins,	Port Carbon,	West Penn,
Hendler,	Port Clinton,	Woodside.

Snyder County.

Beaver Springs,	Kantz,	Penn's Creek,
Beavertown,	Kratzerville,	Port Treverton,
Chapman,	Kreamer,	Selin's Grove,
Cosgrave Hall,	McKee's Half Falls,	Shamokin Dam,
Freeburgh,	Middleburgh,	Troxelville.
	Mount Pleasant Mills,	

Somerset County.

Addison,	Gebhart's,	Somerfield,
Bakersville,	Harnedsville,	*Somerset*, (c. h.,)
Benford's Store,	Jenner's Cross Roads,	Southampton,
Berkley's,	Lavansville,	Stanton's Mills,
Berlin,	Meyer's Mills,	Stony Creek,
Buckstone,	New Lexington,	Stoyestown,
Davidsville,	Pocahontas,	Summit Mills,
Drakestown,	Shade Furnace,	Turkey Foot,
Elk Lick,	Snipesville,	Wellersburgh,
Forwardstown,		Wittenberg.

Sullivan County.

Campellville,	Eldredville,	Millview,
Culley,	Forksville,	Muncy Bottom,
Davidson,	Hill's Grove,	Robinson's Lake,
Dushore,	Laporte,	Shunk,
Eagle's Mere,		Sonestown.

Susquehannah County.

Ararat,	Harford,	North Jackson,
Auburn Centre,	Hop Bottom,	Oakley,
Auburn Four Corners,	Jackson,	Rush,
Birchardville,	Jackson Valley,	Rushville,
Brackney,	Lathrop,	Saint Joseph,
Brookdale,	Lathrop's Lake,	Silver Lake,
Brooklyn,	Lanesboro',	Smiley,
Choconut,	Lawsville Centre,	South Auburn,
Clifford,	Lenox,	South Gibson,
Dimock,	Lenoxville,	Springville,
Dundaff,	Little Meadows,	Summers,
Fairdale,	Lynn,	Susquehannah Depot,
Forest Lake,	*Montrose*, (c. h.)	Taylor,
Friendsville,	Montrose Depot,	Thompson,
Gibson,	New Milford,	Union Dale,
Glenwood,	Niven,	Upsonville,
Great Bend,		West Auburn.

Tioga County.

Bailey Creek,	Gaines,	Morris,
Blossburgh,	Gray's Valley,	Nauvoo,
Brookfield,	Hammond's Creek,	Nelson,
Charleston,	Knoxville,	Oceola,
Chatham Valley,	Lawrenceville,	Ogdensburgh,
Cherry Flats,	Liberty,	Pine Creek,
Covington,	Little Marsh,	Rutland,
Crooked Creek,	Mainesburgh,	Sabinsville,
Daggett's Mills,	Mansfield,	Stony Fork,
East Charleston,	Maple Ridge,	Sullivan,
Elkland,	Middlebury Centre,	Tioga,
Elk Run,	Mitchell's Creek,	Wellsboro',
Farmington Centre,	Mixtown,	Westfield.

Union County.

Buffalo Cross Roads,	Lewisburgh,	New Columbia,
Forest Hill,	Middle Creek,	Port Treverton,
Hartleton,	Mifflinburgh,	White Deer Mills,
Laurelton,	*New Berlin*, (c. h.,)	Winfield.

Venango County.

Agnew's Mills,	Fertigs,	President Furnace,
Big Bend,	*Franklin*, (c. h.,)	Rockland,
Canal,	Holland,	Seneca,
Cass,	Howe,	Stewart's Run,
Cherry Tree,	Maple Grove,	Sunville,
Clintonville,	McCalmont,	Ten Mile Bottom,
Cooperstown,	Nebraska,	Tionesta,
Cornplanter,	Perry,	Tyrrel,
Cranberry,	Plum,	Utica,
Dampseytown,	Plumer,	Wallaceville,
East Sandy,	Polk,	Wesley,
Emlenton,	Porterfield,	Wilson's Mills.

Warren County.

Columbus,	Kinzua,	Spring Creek,
Corydon,	Lottsville,	Star,
Eagle,	Pattonia,	Steam Mill,
East Pine Grove,	Pine Valley,	Sugar Grove,
Freehold,	Pittsfield,	Tidionte,
Garland,	Russelsburgh,	*Warren*, (c. h.,)
Germany,	Sheffield,	West Sheffield,
Jackson Run,	Southwest,	West Spring Creek,
Irvine,		Youngsville.

Washington County.

Amity,	East Bethlehem,	Paris,
Bavington,	East Finley,	Patterson's Mills,
Beallsville,	Eldersville,	Pike Run,
Beck's Mills,	Finleyville,	Prosperity,
Bentleyville,	Florence,	Simpson's Store,
Bower Hill,	Fredericktown,	Sparta,
Brush Run,	Ginger Hill,	Strabane,
Buffalo,	Good Intent,	Taylorstown,
Burgettstown,	Hickory,	Ten Mile,
Candor,	Hillsboro',	Thompsonville,
Cannonsburgh,	Independence,	Van Buren,
Cherry Valley,	Kerr's Station,	Venice,
Claysville,	Lindly's Mills,	*Washington*, (c. h.,)
Clokey,	Locust Hill,	West Alexander,
Coal's Bluff,	Milisboro',	West Brownsville,
Commettsburgh,	Monongahela City,	West Finley.
Coon Island,	Munntown,	West Middletown,
Cross Creek Village,	Murdocksville,	Woodrow,
Dunningsville,	North Star,	Zollersville.

Wayne County.

Aldenville,	Equinunk,	Priceville,
Ariel,	Galilee,	Prompton,
Beach Pond,	Hamlinton,	Purdyville,
Berlin Centre,	Hawley,	Rileyville,
Bethany, (c. h.,)	High Lake,	Rock Lake,
Canaan,	Hollisterville,	South Sterling,
Cascade,	Honesdale,	Starucca,
Cherry Ridge,	Indian Orchard,	Sterling,
Cold Spring,	Jericho,	Stevenson's Mills,
Damascus,	Ledge Dale,	Tallmansville,
Dyberry,	Middle Valley,	Tanner's Falls,
East Sterling,	Newfoundland,	Waymart,
Eldred,	Pleasant Mount,	White Mills.
	Preston,	

Westmoreland County.

Adamsburgh,	Laughlintown,	North Washington,
Bolivar,	Laurelville,	Oakland Cross Roads,
Boquette,	Ligonier,	Parnassus,
Bradenville,	Livermore,	Perryton,
Branch Junction,	Lockport Station,	Pleasant Unity,
Burrell,	Lucesco,	Rostraver,
Cavettsville,	Madison,	Salem Cross Roads,
Conemaugh Furnace,	Manor Dale,	Sardis,
Crabtree,	Manor Station,	Shearer's Cross Roads,
Donegal,	McKean's Old Stand,	Stahlstown,
Fitz Henry,	McLaughlin's Store,	Stewartsville,
Fulton,	Mendon,	Sutersville,
Greensburgh, (c. h.,)	Milligan's Mills,	Tinker Run,
Harrison City,	Millwood,	Verona,
Harvey's Five Points,	Mount Pleasant,	Walt's Mills,
Hillside,	Murrysville,	Weaver's Old Stand,
Hill's View,	New Alexandria,	Webster,
Irwin's Station,	New Derry,	West Fairfield,
Jones' Mills.	New Florence,	West Newton,
Larrimer's Station,	New Stanton,	Youngstown,
Latrobe,		Yohoghany.

Wyoming County.

Bella Sylva,	Furman Hill,	Messhoppin,
Bowman's Creek,	Golden Hill,	Nicholson,
Braintrem,	Genningsville,	North Flat,
Centre Moreland,	Keelersburgh,	Pierceville,
Clinton Corners,	Keiserville,	Russel Hill,
Eaton,	Laceyville,	Scottsville,
Evan's Falls,	La Grange,	Skinner's Eddy,
Factoryville,	Lemon,	South Eaton,
Falls,	Lovelton,	*Tunkhannock*, (c. h.,)
Forkston,	Mehoopany,	Vernon.

York County.

Apple Grove,	Hanover,	Rail Road,
Bald Eagle,	Hanover Junction,	Rossville,
Bryansville,	Hellam,	Seven Valleys,
Castle Fin,	Hetricks,	Shrewsbury,
Chanceford,	Hopewell Centre,	Sidonsburgh,
Clear Spring,	Jefferson Station,	Slate Hill,
Codorus,	Lewisberry,	Slate Ridge,
Cross Roads,	Loganville,	Smith's Station,
Dallastown,	Lower Chanceford,	Spring Forge,
Davidsburgh,	Manchester,	Stewartown,
Dillsburgh,	Margaretta Furnace,	Strawbridge,
Dover,	McCall's Ferry,	Strinestown,
Emigsville,	Mount Campbell,	Union,
Etter's,	Muddy Creek Forks,	Wellsville,
Farmer's,	Newberrytown,	Windsor,
Fawn Grove,	New Bridgeville,	Wrightsville,
Franklintown,	New Freedom,	Yocumtown,
Glen Rock,	Peach Bottom,	*York*, (c. h.,)
Grahamville,	Pine Hill,	York Furnace,
Hall,	Porters Seidling,	Xenia.

COAL OIL EXPLOSION AT GOWANUS, N. Y.—An explosion, attended with fatal consequences, recently occurred in a kerosene oil works at Gowanus, N. Y. The investigation into the cause of the explosion terminated a few days ago. The jury found that the accident was caused by the stopping up of the worm of the still by naphthaline, and state that precautions should be used to prevent such accidents, by keeping sufficient water in the condensers, and having a valve on the stills to indicate danger.

POROSITY OF CAST IRON.—Cast-iron is more or less porous, and under a great pressure, water may be forced through the pores, and appear on the exterior.

GAS IN ENGLAND.—At Bristol, the gas is said to be maintained up to the Parliamentary standard of twelve sperm candles. It is regularly tested by an officer of the Local Board of Health. The price to all consumers, except the rate-payers, has been recently reduced from 4s. to 3s. 9d per thousand cubic feet.

At Bury, the gas-works belong to the Improvement Commissioners, who light, extinguish, and repair the public lamps. According to Mr. Hughes, the gas is invoiced to consumers at 5s. per thousand cubic feet, from which 10 per cent. is deducted for prompt payment, and also another 10 per cent. for profit on the works, making the real price about 4s. per thousand feet. Mr. Hughes tested the gas in March last, when it had an illuminating power of 16½ sperm candles.

At Cambridge, the price of gas has been recently reduced from 5s. 6d. to 5s. per thousand cubic feet.

At Carlisle, the works belong to the corporation, who profess to supply gas of fifteen candle power. They use 7½ per cent. of cannel coal. The price has been lately reduced from 4s. 2d. to 4s., with discounts which bring down the price to the largest consumers to 3s. 4d. In February, 1860, Mr. Hughes tested this gas, when it had an illuminating power equal to twelve sperm candles.

At Cardiff, the price has been reduced to 3s. 6d. according to consumption.

The London *Builder* says the price of gas supplied by the Isle of Thanet Gas Company, is to be reduced from 5s. to 4s. 6d. per thousand cubic feet.

The erection of the Pangbourne gas-works has been commenced near the Great Western Railway station of that village, and the pipes are to be extended to Whitchurch. These works will be under the management of Mr. Bower, who is one of the principal shareholders.

The Durham Gas Company have announced a reduction in the price of gas to private consumers of 3d. per thousand cubic feet. On the following scale of consumption, the prices annexed will henceforward be charged:—Under 150,000 feet, 3s. 9d.; above 150,000 and under 300,000, 3s. 6d.; 300,000 and under 600,000, 3s. 3d.; and 600,000, 3s.

From a pamphlet recently published by Samuel Hughes, Esq., of London, we have gleaned some interesting items relative to the public lighting of several towns in England.

Birmingham is lighted by two companies who light, extinguish, and repair, but do not paint the lamp-posts. The lamps belong to the companies, the posts to the town. The lamps are lighted all the year round from half an hour after sunset to half an hour before sunrise. The price to private consumers has been reduced from 4s. to 3s. 9d. per thousand cubic feet, with discounts varying from 0 to 25 per cent. When tried by Mr. Hughes in February, 1860, the gas had an illuminating power equal to 15 candles, as indicated by the bromine test before the carbonic acid was absorded. The gas, however, usually contains a large amount of carbonic acid. Meters are supplied rent free to the consumers by both the companies in Birmingham.

At Blackburn, the lighting, extinguishing, repairing, &c., cost the town 9s. 4d. per lamp per annum. The price to large private consumers is 3s. 9d. per thousand cubic feet. In March, 1861, Mr. Hughes found the illuminating power of the gas equal to 17⅓ candles.

At Bolton, the price of gas has been reduced from 5s., with discounts to a uniform rate of 3s. 6d. The illuminating power of the gas, as tried several times between December, 1860, and March, 1861, did not exceed 16 sperm candles; but, in consequence of proceedings by the corporation in the last session of Parliament, Mr. Hughes thinks it is probably not less than 20 candles at the present time.

At Bradford, the price to private consumers has recently been reduced from 4s. to 3s. 4d. per thousand cubic feet, with discounts varying from 5 to 25 per cent. The average illuminating power is 14½ standard sperm candles.

GAS-LIGHT ON RAILROADS.—The express train from Manchester to London, England, has been fitted up with a complete apparatus for distributing gas throughout the passenger cars, guard's van, &c. The convenience of this arrangement will be duly appreciated by travellers, who have been long annoyed by the dimness of oil-lamps and candles.

IMPROVEMENTS AND NEW USES OF COAL-GAS.*

(*From The National Quarterly Review.*)

It is a remarkable fact that it is those who boast loudest of our modern discoveries, inventions, and improvements, that appreciate them least, while enjoying their benefits. Nor has any exception been made, in this respect, in favor of gas-light. Those who first proposed to use it in public and private, as a substitute for candles, lamps, &c., were laughed at, as visionaries or charlatans. Neither was ridicule the only weapon with which they were assailed. Some attacked them from the pious point of view, undertaking to prove that there must be something diabolical in the whole affair, since there was nothing to justify it in the Bible; but, on the contrary, that it was more than probable that it was one of those "abominations" alluded to in Revelations, as designed by Satan to lure the unwary to his own regions. Fortunately, no particular Church is chargeable with these silly notions; they were entertained by a certain class among the members of all Churches. Catholics and Protestants thought in turn that, let the ungodly say what they would, the true source of the new light was "the lake that burneth with fire and brimstone." The only difference was, that when one sect took a certain view of the case, the other took the opposite; the same as, when the Catholics condemned Galileo, the Protestants cried shame; and then, when it was thought he was forgiven, they cried shame again. The spirit of superstition and bigotry had subsided, if it had not altogether disappeared, in Mr. Murdock's time; and we may remark, in passing, that it has not been confined to any religion. Innovations on received opinions have always encountered opposition. If the Inquisition at Rome persecuted Galileo, Copernicus received no better treatment from the learned universities of Germany, but rather worse; for no indulgence was given to the latter—no kind friends of genius and science opened their doors to him. To continue the comparison, gas-light fared no worse than the medicine now called Peruvian bark, which, under its original name of Jesuit's bark, was long regarded by many well-meaning people as nothing less horrible than a poison that would kill the soul as well as the body; and for no better reason than that it was discovered by the Jesuits. In a similar manner the Catholics may reproach the Protestants for having persisted for two hundred years in rejecting the Gregorian calendar, because it was invented by the Pope. Thus, in 1582, the Julian calendar was reformed by Gregory XIII.; but it was not until 1752 that the change was recognized as an improvement in England, when the Julian deficiency had amounted to eleven days. Even to the present day the Mohammedans in all parts of the world adhere to the old style, because it was the style of the Prophet; whereas, they say, our style is an unwarrantable and impious innovation, by the Roman mufti, under the pretence that he knew more about the secrets of the heavens than Mohammed, who had explored them all!

We might easily add to these instances of opposition to what in time gained the approbation of all Christendom; but we trust we have said enough to console those who were opposed to one of the best of modern improvements, with the reflection that, absurd and short-sighted as they have been, they can refer to abundant examples to keep them in countenance. But even after the availability of gas, as the best and cheapest light, was fully demonstrated, it was still asserted that its use was attended with innumerable evils. One party held that it was a deadly poison; another, that it was, if possible, more dangerous in one's room than a barrel of gunpowder; while a third felt sure that it would be the ruin of all fine furniture, paintings, clothes, &c. Had these fears been confined to the vulgar, there would be no reason to wonder at them; in that case they were no more than might have been expected. But they were shared by dukes, earls, lords, and even by doctors, who called themselves learned and scientific. More than once investigations were made before a select committee of the British Parliament, which are curiously illustrative of this fact. What is particularly remarkable is, that some of those who claimed to be inventors committed blunders in relation to the matter which are nearly as ludicrous as those of their less fortunate neighbors. A Mr. Accum undertook to explain the whole process of gas-making, in order to prove that he was the original inventor; but during his examination before a Committee of the House of Commons, of which the great ex-Chancellor, then Mr. Brougham, was the assessor, the following question was proposed to him: "Do you mean to say that the area of a circle of two inches in diameter is only double that of a circle of only one inch in diameter? A. My opinion is, that it is double; your opinion may be that it is four times, but mine is that it is double." Here was a man, pretending to be a mathematician, who could not tell how to find the area of a circle; otherwise he would have known that the ratios of circles to each other are as the squares of their diameters. Through similar ignorance, Mr. Clegg nearly burned off his own nose; and a Mr. Lukin blew up a valuable furnace at Woolwich Dock-yard. True, it was surmised at the time that the two latter were more knaves than fools, when these accidents occured to them; that their object was, to frighten the people in order to make a place for a Government inspector of gas. Be this as it may, the citizens of London were greatly afraid. They did not know how soon they might be blown to atoms in their beds; nay, there were not a few who predicted that some fine morning the whole city would be converted into another Pompeii, or Herculaneum, the gas-pipes having exploded and laid all in ruins. This may seem exaggeration on our part, but it is not. The wonder would have been, had the people been otherwise than frightened, when Sir William Congreve (one of the candidates for the inspectorship) gave it as his deliberate opinion that mixing the gas with five-sixths of atmospheric air, and exploding it, the force was such that four hundred and eighty cubic feet of gas would exert the same power as a barrel of gunpowder, and if mixed with four-fifths, it was such that fifteen thousand feet of gas were equivalent in power to fifty-two and a quarter barrels of gunpowder. The Royal Society takes the matter in hand, and makes the terrible discovery that fourteen thousand feet of gas would explode with as much power as ten barrels of gunpowder! Such was the opinion of the most learned society in England at the time. No wonder that it was deemed serious enough to be brought before another Parliamentary Committee; and Sir Humphrey Davy, being summoned to give his opinion, stated that he conceived that the Society did not overrate the danger. We need hardly remark that the chemists of all Europe were astonished, as well they might be; and that the reputation of Sir Humphrey suffered more by this "opinion" than it has gained since. The cause of the mistake, if such it may be regarded, was, that although several members of the Royal Society, as well as Davy, had studied chemistry, and doubtless understood it passing well, they had neglected to make the necessary experiments. It was in vain, however, that the gas manufacturers, laughed at their "conclusions," as the author of Hudibras had done before them, and assured their customers that, with the most ordinary precautions, they had nothing to fear. How could the latter believe that the most learned body in England, with the famous Sir Humphrey Davy at its head, would deliberately frighten them; yet their own experience was entirely opposed to the opinion of the *savans*. They were not supposed to know that it was in ridicule of the same society that Butler had written his famous satire entitled "The Elephant in the Moon," more than two hundred years previously. And the same satire was perfectly applicable at the time of the "investigations" and "reports" referred to; for surely those, who mistook a mouse in their telescope for an elephant in the moon, were not a whit more credulous or silly than their descendants, who predicted the most frightful catastrophes from gas, because a Mr. Clegg so little understood its properties, that he hurt his nose with it. In Butler's time, the society had its Sir Humphrey, too—a sort of Supreme Court Judge, whose opinion served as a fiat to their "reports"—

> "This, said another of great worth,
> Fam'd for his learned works put forth,
> Looked wise, then said: '*All this is true*,
> And learnedly observed by you,'" &c.

At all events, thus did the matter stand until Professor Faraday proved, by various experiments, that the calculations of his learned brethren were founded on false premises. It is worthy of remark in passing, that while the more recent part of this fuss was being made in England, in regard to the properties of gas, Mr. Charles Roome, who was then but the engineer (now President) of the Manhattan Gas-light Company, of this city, was silently and unostentatiously making improvements in the manufacture of gas, which have since been adopted in Paris, as well as in London. This will seem all the more creditable to our fellow-citizen, when it is borne in mind what serious inconvenience he had to labor under in comparison with those placed in corresponding positions, in the principal cities of the old world. In the first place, the latter had an experience of eight years before we had any gas in this country, London having been lighted with gas in 1814; whereas, New York was not lighted until 1823–4. It would be seen that the experience in England was much longer, were we to take into account the fact that so early as 1802, gas-lights were used at Bolton and at Watt's foundry, in Birmingham.

The gas manufacturers of England had within their reach all the facilities that science could afford; the accumulated treasurers of the best scientific institutions in the world were open to them. It was otherwise with Mr. Roome. The scientific institutions of America, even so recently as twenty years ago, were little more than in their embryo state. Such as they were, however, Mr. Roome derived little, if any, benefit from them; for he is a self-educated, self-made man. His experiments, as well as his studies, were conducted in secret; generally without suitable apparatus. Even the coal, as we shall presently see, he had to get principally from England. Yet, so far as we are aware, he was the first to prove, to all who were willing to be convinced, the entire harmlessness of gas when the most ordinary precautions were taken to prevent explosions, and the little real similarity it has to gunpowder, let the Royal Society, Sir William Congreve, and even Sir Humphrey Davy, give any opinions they thought fit to the contrary.

Twenty or thirty years ago, as well as now, whatever created a sensation in England was pretty sure to produce a similar effect in this country. At any rate, the reports of the Royal Society startled the good people of New York. Not a few of them were willing to return to the use of candles, or even rush-lights, rather than be, as they were led to think, in constant danger of being blown to atoms, or engulfed into the bowels of the earth by the terrible gas! Mr. Roome made no display before learned societies, or anywhere else, but quietly wrote a pamphlet, in which he pointed out, in plain and popular language, the difference between gunpowder and gas, as follows:

"When gunpowder is burnt," says Mr. Roome, "about one-half of it is converted into an air, which is permanent at the atmospheric temperature and pressure. Thus one hundred pounds weight, which is a barrel of powder, will produce fifty pounds weight of air; or, in other words, a cubic foot of gunpowder will generate a permanent atmosphere two hundred and sixty times greater than itself; or, what amounts to the same, a barrel of gunpowder, weighing one hundred pounds, will produce two hundred and sixty barrels of air, or about two thousand six hundred gallons. The explosive power of this is easily ascertained; any intelligent chemist can prove it. Confined in a tube, and thus condensed that number of times, at the moment of its production, it is the pressure that discharges a ball; whereas, at liberty, it is a sudden blast of wind, acting on the surrounding atmosphere first, and the adjoining solids in succession, and continuing to act till a mean density of the general atmosphere is restored. Now, it is under circumstances nearly the reverse of all this that an explosion of a mixture of hydrogen and oxygen takes place; the result is a negative, not a positive quantity. The report is indeed nearly, if not quite, as loud as that produced by gunpowder: but it is more the effect of collapse than of the first slight expansion. In other words, the quantity of gas is lessened by an explosion, while it is

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1. **An Historical Sketch of the Origin, Progress, and Present State of Gas-lighting.* By WILLIAM MATHERS. London: 1857.
2. *Advantages of Gas-light in Private Houses.* By J. O. N. RUTTER, F. R. A. S. London: 1850.
3. *L'Année Scientifique et Industrielle.* Par LOUIS FIGUIER. Paris: 1861.

largely increased in the case of gunpowder. Besides, it is only at a certain temperature and density that gas will explode at all; whereas gunpowder would cause a very great explosion, though in an atmosphere down to the freezing point—nay, below zero."

We believe that to the same gentleman is due the credit of having been the first to urge that copper is not suitable for gas-pipes. When the warnings of science involve an outlay of money, they are too apt to be disregarded by those having the control of the latter. It was so in this case. But an accident or two occurred in New York, in 1839, which decided the point.* A workman engaged in carrying copper gas-pipes, which had been in use for several years, took it into his head to whistle with one of them. Not only did a violent explosion take place, but the unfortunate man's mouth and nose were so much lacerated that he died in a few hours. A similar accident occurred soon after, but fortunately without fatal result. Enough had been seen, however, to prove that Mr. Roome was right; his suggestions were adopted accordingly; and we have not heard that a single serious accident has occurred in the city since, except as the result of the most culpable negligence.†

Before we return from this digression, to note some of the improvements made in recent years—and nowhere more than in New York—in the manufacture of coal-gas, we will make an observation or two on the generally received opinion, that gas-light is a modern discovery. In this, as in most other cases, we are too apt to contrast our own knowledge with the ignorance of our ancestors. If we stopped at this, it must be confessed that we should not be much in the wrong; but when we extend the comparison beyond the Goths, Huns, and Celts, to the great nations of antiquity, we find a different state of facts. There is good reason to believe that not only the ancient Egyptians and Hindoos, but also the ancient Peruvians and Mexicans, made use of some of the inflammable gases for heating, as well as for lighting purposes. That the Chinese had done so thousands of years before Mr. Murdock was born, is no longer a matter of mere conjecture. The fact is now as indisputable as the existence of their Great Wall. Humboldt tells us that carburetted hydrogen had been used in the province of Ste-tschuan for several thousand years; and that it was so far under control, that it was carried about in bamboo canes, to be used as occasion required, the same as a candle or a lamp.‡ Guy-Lussac and Professor Adelung, and several other scientific men of equal eminence, were of opinion that it was the occasional ignition of these natural gases which gave rise to the sun worship of the East, it being well known that deposits of petroleum, or naphtha, furnish gases which issue in streams from fissures in the earth, and which are ignited by various means, including lightning or electricity. Almost everybody, who has resided in the neighborhood of coal mines, has observed phenomena of this kind. Dr. Henry, of Edinburgh, in speaking of the "fire damp," so much dreaded by colliers, informs us that, from an old unwrought seam at Wallsend, colliery, "a discharge of this gas takes place through a four-inch metallic pipe of two cubic feet per second. The pipe is carried up as high as the head gear above the shaft, and from its orifice issues, with a roaring sound, the stream of gas, which, having been ignited, forms *a flag of flame seven or eight feet in length, conspicuous by day, and at night illuminating the whole neighborhood.*"

Not only have fewer accidents occurred in this country than in England, in proportion to the amount of gas used, but the whole business of gas manufacture has succeeded better with us than with our friends on the other side of the Atlantic. This is admitted by so high an authority as Prof. Faraday, who admits also that the cause of the difference is to be found in the superior intelligence which presides over the American works. "This," he says, "is perhaps the only instance in which the Americans surpass us in the practical operations of science, but that they do surpass us in it, there can be no question." Dr. Henry, in commenting on this, is constrained to acknowledge the fact; but, he adds, that it is a state of things that has occurred accidentally—because there was so much prejudice against the introduction of the gas in England, that only an inferior class of minds engaged in it; whereas in America it engaged at once the attention of some of our best thinkers—a difference which has been maintained to the present day. A few simple facts, the truth of which cannot be disputed, will place this in a clear light. In the first place, it requires twice the amount of permanent capital to carry on the same amount of business in America that it does in England, for these reasons: The price of labor is double. In England one pound sterling per week pays for the services of the gas-maker; whereas, in New York, services of the same kind and amount cost from $9 50 to $10. Nearly half the coal used by the Manhattan Gas-light Company has to be imported from England, because the English coal is so much superior to the American coal. More has to be paid for freight on the imported article than for the article itself, and it involves an additional cost of twenty-four per cent. duty. Although coal costs thus twice as much in New York as it does in London, coke sells for the same price in the former, that it does in the latter, city. This may seem strange, but it is no less a fact, and one that can be easily accounted for. In New York the coke has to compete with anthracite coal, whereas in London they have no anthracite.* Besides, the castings for retorts and street-pipes can be purchased in England or Scotland, and sold in New York (paying freight and duty), at as low a price as the similar castings produced here. Notwithstanding all these disadvantages and inconveniences, the gas costs very little more in the American, than in the English, metropolis; indeed, if the quality of the gas be taken into account, and the manner in which the money is collected, it may be said to be as cheap here as it is in London. But were we charged three times as much as our friends on the other side of the Atlantic, certain it is that, under all the circumstances, we should have no reason to complain.

In order to be able to judge for ourselves as to the justice of the above comparison, so complimentary to New York, we have visited the gas-works of both of our city companies; also the Brooklyn works. This, however, would not have qualified us to come to any definite conclusion on the subject, had we not previously made similar visits to the London works. True, it is some five or six years since the latter were made; but we doubt whether any very important improvements have been made in them since. At all events we are sure that they do not exhibit more neatness, and are not conducted in a more orderly manner, than those of the Manhattan Gas-light Company; nor do we mean by this any reflection on the London works, which are not surpassed, in these respects, by any similar works in Europe. But in our opinion those at Fourteenth street and Eighteenth street may be regarded as models. Never have we seen machinery of any kind kept in more perfect order. To say that it is scrupulously neat in all its ramifications, would give little idea of the brilliant polish everywhere presented by all parts of it that are susceptible of polish. It is not our intention to enter into particulars. A description of the Eighteenth street works alone would fill our whole article; for they are on a scale of magnitude, of which few, who have not visited them, have any adequate idea. But the miniature "works" alone—those used for testing the qualities of different kinds of coal, sent for that purpose from all parts of England, as well as this country—would amply repay the scientific student for the trouble of a visit, though he were not to enter the general laboratory at all, or witness the experiments by which the comparative purity and brilliancy of the gas are tested. At Fourteenth street and Eighteenth street, there are five retort-houses, which contain 1,948 retorts, and fifteen telescopic gas-holders, containing a total of 4,069,000 cubic feet.

The annual amount of gas manufactured is 786,432,000 cubic feet. This is carried through pipes whose aggregate length is over 220 miles, extending, as they do, in all directions, from Grand street to Seventy-ninth, varying in diameter from three to twenty inches, and supplying about 27,000 private consumers, and nearly 9,000 street lamps. The amount of coal necessary to produce all this gas exceeds 79,000 tons per annum; about one-half of which is imported, at a cost of from $7.00 to $11.50 per ton; and we believe the present price of the gas is $2.50 per 1,000 cubic feet. There are only two cities in the United States, so far as we are aware, where it is sold cheaper than this, namely, Philadelphia and Pittsburg.* In the former, the price per 1,000 is $2.13, in the latter $1.50; but that there is a much greater difference between the qualities of the different articles, all who have seen the three kinds are aware—so great, indeed, that the New York gas is the cheapest in the end. This will be the more easily understood when it is borne in mind that, in other cities and towns where coal has to be imported, as in New York, the prices range from $3.50 to $6.50 per 1,000 cubic feet.

The consumption of gas is not so great in this city as it is in London, in proportion to the population, because in the latter city it is used for various purposes, to which it has not hitherto been applied in New York. It may seem strange that there are hundreds of families in London who never have any artificial heat in their houses but that produced by gas. Nor must it be supposed that they labor under any privations on this account. They have gas stoves, of such construction that they heat their rooms, so as to render them perfectly comfortable; and they have stoves of another form, which serve for cooking purposes.† If it be objected that these must necessarily produce a deleterious atmosphere, the answer is, that gas is now used both in Europe and America for the express purpose of ventilation—for purifying instead of adulterating the air. Nowhere is it more extensively used for all the purposes mentioned, than in London, though the London gas is decidedly of inferior quality, far inferior to ours, especially when considered in a sanitary point of view. So defective is it regarded in this respect by those best competent to test its qualities, that the two Houses of Parliament continued to be lighted with candles for years; both Lords and Commons objecting

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* See the AMERICAN GAS-LIGHT JOURNAL, vol. 1, page 55.

† We find these cases and their results noticed in the French *Année Scientifique* for 1861, the writer giving a full and interesting explanation of the cause and character of the explosion; and concluding with the statement that iron has been almost universally substituted for the copper, and consequently that no such explosive substance has since been found. "Au, cuivre primitivement employé en Amérique pour former les tuyaux de conduite du gas de l'éclairage, on a presque partout aujourd'hui substitué le fer. Or, le gas de l'éclairage ne produit pas, en agissant sur le fer, de composé fulminant analogue à ceux dont nous venons de nous occuper. Aussi depuit cette époque, l'occasion ne s'est-elle plus offerte, en Amérique, de retrouver ce singulier produit. Par son contact avec le plomb, le gas de l'éclairage ne fournit pas non plus le composé qui nous occupe."—*Année Scientifique*, p. 154.

‡ *Cosmos*, vol. i., p. 217

* Independently of this competition, there are a great many well-meaning people in this country, who labor under the impression that inasmuch as coke has already been partly burned, and deprived of its gas, it follows that it cannot produce so intense a heat as coal; but that the reverse of this is the fact, has been proved by the best chemists. Dr. Henry, of Edinburgh, informs us that he has "learned that the heat produced by coke, when compared to that produced by coal, is at least as 3 to 2." Mr. Winsor, having made experimenis with the same view, found that it required *three* bushels of coal to distil a given quantity of water, and only *two* bushels of coke. Being rather surprised than satisfied with this, he tried the same substances by combustion, with a certain measure of oxygen gas, but with a similar result. This set the matter at rest in England, so far as the relative heat was concerned; but then it was said that if coke made as hot a fire as coal, or hotter, at least the former was not as wholesome as the latter. This, too, the most learned chemists and physicians pronounced a gross error. Ever since, the demand for coke has been so great in all the large cities of England, that the gas manufacturers cannot produce sufficient to supply it. But in this country it is different. In spite of our innumerable free schools and armies of teachers, the old prejudice still prevails against coke; whereas, in point of fact, it is superior to coal in every property that ought to recommend it for family use, except the rapidity with which it burns. In other words, coal lasts longer than coke; and this is the only sense in which the former can be said to be superior to the latter.

* In Brooklyn, N. Y., the price has been reduced to $1.50 per thousand cubic feet—the same rate which rules at Pittsburgh, Pa.

† "By the aid," says Prof. Rutter, "of a simply constructed apparatus, gas performs the respective processes of roasting, baking, frying, boiling, steaming, &c., and with a precision that cannot be attained by means of a common fire. Two or three days' experience is sufficient to enable servants to conduct any of the above mentioned operations with certainty as respects time; whilst the trouble and attention required, are less than by the ordinary method. It is acknowledged by those who have witnessed the process of roasting by gas, that it is the most perfect in the culinary art; the meat being cooked uniformly, and the juices (on which its nutritious qualities and delicacy of flavor so much depend) being retained until brought to table."—*Advantages of Gas-Light*, &c., p. 32.

to its introduction, on the ground of its being deleterious. No doubt the "reports" of the Royal Society had considerable influence in thus preventing its admission. Finally, however, it was resolved to introduce it, but only in a purified state. Though we have seen the improved light ourselves, we prefer to present the facts from an English point of view; so that we may not incur the suspicion of seeking to depreciate the London gas, as compared to our own. In *Chambers's Edinburgh Journal*, No. 445, there is an interesting article on the subject, from which we take the following extract, premising that the gas, in its improved state, is known as the "Bude Light:"*

"This gas is made to pass through a box containing naphtha, which naphthalizes it and renders it equal to the best oil, without the trouble of wicks. The London street gas, *it is necessary to explain, is of bad quality, and it is improved by the vapor of naphtha.* * * The apparatus for supplying the oxygen is placed in a vault, adjacent to Dr. Reid's ventilating process. It consists of two iron retorts, built over a furnace, and in these is put a certain quantity of oxyde of manganese, from which oxygen is evolved, and led away in pipes to a gasometer; from the gasometer small pipes proceed to the burners in the house, each conducting a stream of oxygen into the heart of the flame. The light so produced is most intense in brilliancy, but is softened by the intervention of ground glass, and illuminates with a powerful effect the whole interior of the apartment. * * The flame being supplied freely with oxygen, a comparatively small quantity of atmospheric air is abstracted, or consumed, and all offensive heated air from the combustion is carried away in a small tube into Dr. Reid's ventilating gallery above. Before the introduction of this beautiful light, the House of Commons was illumined with two hundred and forty wax candles, dispersed about in different parts; a method of lighting which Sir David Brewster has described 'as most absurd, and such as no person, at all acquainted with the physiological action of light on the retina and the principles of its distribution, could have adopted.† If I recollect properly, the expense of using the Bude light, in which naphtha is required, is about twelve times greater than that of common London gas, sizes of flame being equal; but that as the Bude flame gave twelve times more light, *the expense was in reality the same*, without the inconvenience of many burners and a great consumption of air. Another useful property is, that the light may be varied in tone from the most perfect white down to the red ray, by increasing or diminishing the quantity of oxygen."

Fortunately, there is no need for the use of naphtha in New York, in any large quantity; indeed, we are not aware that any of it has to be used at all. The Liverpool or cannel coal does not need it; nor does the American coal, which is mixed with it—at least, when properly distilled. It may be asked, why cannot the London companies procure the same kinds of coal, and thereby obviate the necessity of using naphtha? So they could, no doubt, if they chose to incur the necessary expense; but it must be remembered, that, although the Liverpool coal is much nearer to London than it is to New York, it can be brought to the latter city at a much cheaper rate, or, rather, we should say, at a rate much less expensive.

Those who have never paid any attontion to the subject, have little idea of the elaborate processes through which coal-gas has to pass, from the time the coal is put into the retort, until the former is fully purified and fit for use—processes, many of which require the nicest skill of the chemist. Even to determine the quality of the gas, after it has been manufactured, by photometric observations, as Mr. Roome does daily, at his private office in Irving place, requires no small amount of chemical knowledge and experience. For the benefit of those unacquainted with chemistry, we will here state a few facts in illustration of this. Gas, prepared from coal, is a compound, chiefly composed of two inflammable gases, known as olefiant gas, and light carburetted hydrogen. Each of these is compounded in turn of hydrogen and charcoal. There are several other gases which enter into the composition of coal-gas, but only in small proportions; and be it observed that these proportions are constantly varying, according to the quality of the coal, the skill and care bestowed on its manufacture, &c. The analysis considered most correct at the present day, as an average, is that of Dr. Henry, which, from 100 measures of coal-gas, whose specific gravity is .650, is as follows:

Olefiant gas	16
Carburetted hydrogen	82.2
Carbonic oxyde	3.5
Nitrogen	1.3

The first of these is composed of 2 atoms of hydrogen and 2 atoms of charcoal; and the weight of 100 cubic inches is 29.652 grains. When pure, it has neither taste nor smell, it burns with a dense white light, combining with three times its bulk of oxygen. In carburetted hydrogen, there is but 1 atom of charcoal to 2 atoms of hydrogen, and its specific gravity is .5555. This is the only constituent of coal-gas which has any tendency to explode. Combining with twice its bulk of oxygen, it burns with a dull yellowish flame, and will produce no explosion, except when mixed with from 5 to 14 times its own weight of atmospheric air. The more olefiant gas contained in any given quantity the better is the light, and the heavier the compound; hence it is that the best gas is the heaviest, and the worst the lightest—light carburetted hydrogen predominating in the latter. Here we have an explanation of the manner in which certain companies, both in this country and England, pretend to furnish gas at a cheaper rate than their rivals. The author of the article *Gas-light* in the "Encyclopædia Britannica," gives the following facts as the results of experiments on light (defective) coal-gas—or gas, in which there was a superabundance of light carburetted hydrogen: "We took," he says, "a portion of the specific gravity of .67, which we found consumed at the rate of 4,400 cubic inches per hour, and yielded the light of 11 candles, being 400 cubic inches per hour for the light of one candle. This gas, being diluted with a fourth part of its bulk of pure hydrogen, acquired the specific gravity .55, *and wasted away at the rate of* 6,545 *cubic inches per hour, yielding the light of* 10 *candles.* As a fifth part of the compound gas was hydrogen, the remaining four-fifths, amounting to 5,236 cubic inches, was the quantity of the coal-gas, which in its diluted state gave the light of ten candles, for an hour; *so that* 524 *cubic inches of the original coal-gas were requisite to give the light of one candle for the same time.* But, in its unmixed state, 400 cubic inches were sufficient to give the light of one candle for an hour, and consequently the deterioration caused by the dilution was in the ratio of 524 to 400, or of 100 to 76, *being* 24 *per cent.*" Now, need we say, that those who offer this kind of gas 10 or even 20 per cent. less than others charge for the heavy gas, which burns at once slowly and brilliantly, instead of selling cheap, sell much dearer than those whom they would break down; the difference being often nearly as great as that between "shoddy" and genuine broadcloth.

The truth of all this can easily be tested by any intelligent person, so that one can judge coal-gas pretty nearly as accurately as any other article of commerce. Thus, in the first place, there is no truer criterion whereby to form an opinion of the value and durability of any particular quantity of gas, than by its *weight*, and *vice versa*. In good, pure gas, there ought to be neither carbonic acid nor sulphuretted hydrogen; at least, not so much as to exercise any perceptible influence. But, if they are present, the fact can easily be proved. To determine whether there is any carbonic acid present, all that is necessary is, to shake a portion of the gas with lime water in a phial; if the acid be present, it will form carbonate of lime, and render the water turbid. It is still easier to determine the presence or absence of the sulphuretted hydrogen. All that is necessary is, to wet a slip of paper with a solution of sugar of lead; if there is so much as one part in twenty thousand of the foreign substance present, the solution of lead instantly becomes brown or black.

Much also depends on the character of the burners; a fact too often lost sight of. There are many who think that they act economically in getting what they call cheap gas-fixtures; and after having done so they wonder how it is that their gas-bill is so high at the end of the month or quarter. Sometimes they make complaints and accuse the gas company of overcharging them, and it is not until the fact is pointed out that it occurs to them that the gas-fitter has had any hand in the increase of consumption, which they call an overcharge for what they have really used.

We had intended to enter into particulars on this branch of the subject; for it is one in which all who use gas are more or less interested; but we find now that we must postpone its consideration for a future occasion. In the mean time, the extensive new works, now in progress at Seventy-ninth street, will have been completed, affording us new facts and data whence to draw conclusions, which will be interesting at once to the man of business, the political economist, and the scientific student. Although we cannot thank Mr. Charles Roome for having furnished a single fact to aid us in the preparation of our article, further than we have gleaned from his writings, wherever we could find them, we are not the less willing to acknowledge our conviction that he has deserved as much of his countrymen, for his scientific labors, as Mr. Stephenson and Mr. Dargan have deserved of theirs; and each of the latter has been suitably honored. We make this admission all the more readily, because it is modesty—not any lack of courtesy or politeness—that has prevented Mr. Roome from affording us all the facilities in his power.

LARGE PUMPING-ENGINES.—The Haigh Foundry Company, whose works are near Wigan, have, within the last month, erected a Cornish pumping-engine, with a cylinder 100 in. in diameter, and with a stroke of 10 ft., at the Talargoch Lead Mines, near Rhyl, in Flintshire. At Mostyn, about 10 miles distant, is an engine erected, in 1852, by the former proprietors of the Haigh Foundry for Lord Mostyn, at his colliery at Mostyn. This engine, which has been constantly at work for nearly 10 years, is direct acting and condensing, on Bull's principle. The cylinder is 100 in. diameter, and works a stroke of 14 ft.; it has a wrought-iron steam-jacket. The piston-rod, which is 10 in. diameter, is connected direct with the pump-rods, through a wrough-iron cross-head. The ends of the cross-head form slide blocks, and work in cast-iron slides, built into the walls of the cylinder pillar. The balance beams are made of wrought-iron plates, &c., and are 42 ft. long and 6 ft. deep in the centre; they are connected with the main pump-rods, at a distance of about 35 ft. below the cross-head, by two wooden connecting rods, having wrought-iron straps and brass steps. The beams are loaded, at their outer end, with cast-iron blocks, weighing altogether about 30 tons, to compensate for the superfluous weight of the pump-rods, which are necessarily heavier than the column of water. The air-pump, cold-water pump, feed-pump, and tappet-rods, are worked from a wrought-iron centre in these beams. The engine is raising a column of water equal to 24 in. diameter, from a depth of about 250 yards, by means of three plunger-pumps, each lift of about 65 yards, and two bucket-pumps, side by side, with a lift of about 55 yards. Owing to the bad quality of the water the plungers, clacks and buckets are made of brass, and the working-barrels are also lined with brass. All the pump-stocks are faced iron to iron, and the joints are formed by a little tar, without any other packing. The pumps and boilers were all made at the Haigh Foundry. The engine usually works at a speed of from three to four strokes per minute, but it has worked with ease at a speed of six strokes, when the quantity of water has been such as to call for this additional speed.—*London Engineer.*

DIFFUSION OF GASES.—Professor Graham, of her Majesty's Mint, London, has found on examining gas in mains, that as much as 25 per cent. of atmospheric air has penetrated the pipes and mingled with the gas. This peculiar property of gases is termed by chemists, *endosmose*, by which gases will pass through even solid substances, and mix with each other. In this manner the appearance of gas in water-pipes has been accounted for.

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* [The original Bude light consisted of a common Argand oil lamp of a narrow circular bore into the centre of whose wick a jet of oxygen gas was admitted through a tube inserted in the middle of the burner. This being too expensive, and difficult to manage, was substituted for the naphthalized gas-light.—ED. AM. GAS-LIGHT JOUR.]

† Report of Committee on Lighting the House.

ILLUMINATING GAS FROM PETROLEUM.

The following circular will be read with interest by those of our readers who are connected with the petroleum interest:

109 KING STREET WEST, TORONTO,
April 3, 1862.

Sir,—We beg to inform you that we have secured a patent in Canada for the manufacture of Illuminating Gas from Crude Petroleum.

Our process is susceptible of being applied on any scale, from the lighting of a dwelling-house to that of the largest city.

Three materials are employed in the manufacture of our Illuminating Gas. These are, Crude Petroleum, Water and Charcoal or Coke, all of them accessible and cheap, and from the extraordinary abundance of Petroleum in Canada and the United States, this body is likely to remain so.

The qualities which we confidently expect will secure for Petroleum Gas your favor, are:

1st. *Its extraordinary illuminating power.*

2d. *The mildness and softness of its light.*

3d. *Its cheapness.*

4th. *The ease with which a supply can always be controlled for illuminating, heating, or cooking purposes.*

A ONE foot burner gives a flame as large as a FOUR foot burner of the common coal gas supplied to cities and towns. The comparative smallness of the flame greatly diminishes the heat, which is often found so oppressive in large rooms lighted with coal gas. The absence of the flickering, which is often disadvantageous and disagreeable in common coal gas, is another quality which it can be made to possess. Until the recent adoption by the public of coal and petroleum oil lamps, coal gas was considered to be by far the cheapest illuminator known. Since the discovery of a process for manufacturing gas from petroleum, to burn without smoke or smell from ordinary gas-burners when properly made, coal gas has been far surpassed in cheapness by petroleum gas, and a milder, steadier, yet stronger light secured.

Its cheapness may be inferred from the following brief statement:

Five gallons of crude petroleum distilled and converted into gas according to our process, make one thousand cubic feet of gas. But one cubic foot of the petroleum gas is equal in illuminating power to *four* cubic feet of common coal gas, so that in effect five gallons of petroleum are capable of producing an amount of light represented by 4,000 cubic feet of coal gas, or from $12 to $16 in money, according to the present ratio of gas charges in Canada. Where gas is required to be manufactured on a large scale, it is desirable to remember that petroleum and water are easily handled, and can by their own flow supply the retorts continuously and without waste, thus doing away with the unceasing labor of continually replenishing the retorts with coal, and the expense entailed in the maintenance of numerous hands.

With respect to public buildings, one man giving three hours' attention per day to the manufacture of petroleum gas, can produce by our patent process, enough gas to supply 100 burners with full pressure for ten hours, at a cost of material not exceeding ONE DOLLAR, fuel for distillation included, or at from one-fourth to one-third the cost usually charged by the gas companies now existing in Canada.

The substitution of petroleum for coal in gas-works now in operation, can be effected with very little additional expense.

In public and private buildings where it is desirable to introduce petroleum gas, a detached room would be required, according to the capacity of the works. The pipes and burners now used by gas companies are in all respects adapted to the petroleum gas, with this difference, that where a FOUR foot burner (the one in common use) for coal gas is employed, a ONE foot burner for petroleum gas would have to be substituted. Petroleum gas burning through a FOUR foot coal gas burner is a magnificent illuminator, and one which would not often be used for ordinary purposes.

Any communications relative to the introduction of the Patented Petroleum Gas into public buildings or private houses, may now be addressed to James E. Thompson, 109 King Street, West, Toronto; and if the applicant states the number of burners required to be supplied, an estimate of the size and cost of the apparatus will be returned without delay.

We are, sir, your obedient servants,

JAS. E. THOMPSON,
Hydraulic and Gas Engineer.
HENRY YOULE HIND, M. A.,
Prof. of Chem. & Geol. Trin. Coll., Toronto.

CAUTION TO THE PUBLIC.

The public are respectfully informed that Messrs. James E. Thompson and H. Y. Hind, have secured patents for—

First. An *apparatus* for the manufacture of Illuminating Gas from Crude Petroleum or Rock Oil.

Second. A *process* for the manufacture of Illuminating Gas from Crude Petroleum or Rock Oil.

And they claim—

1st. "The invention of a portable or stationary iron or clay Compound Retort for the simultaneous production of gases from petroleum and water, by means of which retort a useful, rich, and economical illuminating gas can be obtained."

2d. "The simultaneous production within the same Compound Retort, of gases from crude petroleum and water, or in a different and separate retort, if the gases are subsequently brought together at a red heat, to effect the requisite combinations; also the purification and deoderizing of the gases by means of dilute hydrochloric acid, or other suitable acids, so as to fit the gases for combustion under ordinary circumstances."

The Patentees will take legal proceedings against parties infringing their patented rights.

OIL WELLS IN CANADA WEST.

The facetious correspondent of the *Canada Free Press* in a letter dated Olicia, C. W., April 4, thus discourses of oil matters in that region:

OLICIA—ENNISKILLEN.—"Oil Springs!" and out we jumped, prepared for a tour of discovery. We put up at McCrae's hotel, which stands very conveniently on the corner as you enter the village. The landlord welcomed us, and, after substantial refreshments, we set forth. You would have enjoyed a peep at your correspondent. Just imagine a man of my weight and proportions obliged to tramp through mud, water, oil, and all manner of dirt. Imagine, if possible, a heavy, rough-looking pair of knee-boots, very dilapidated pants, an ancient coat, and more ancient stick, and you will have my picture.

OFF TO THE WELLS.—Mr. Henry McCrea, well known by his correspondence to several papers concerning oil matters, volunteered to accompany us, and we were only too glad to accept his kind offer. Splashing through mud, slipping and grumbling, we followed our sturdy friend, making furious attempts to keep pace with him. But we might as well have endeavored to keep pace with the march of civilization.

"Here's a creek—we must wade!" Horrible! go through all that shiny-looking, greasy-surfaced water? "Only oil." This last was the answer to our remonstrance. Despair makes men brave, as conscience makes cowards of them—for with desperate energy we followed our guide, and soon arrived at the destined point.

FLETT & PETTIT'S WELL.—Another flowing oil well, which doubtless you'll hear of ere receiving this. On Monday, March 31st, the oil suddenly burst from its bed, and darted high above the platform. It took but a short time to deposit 3,000 barrels at different points on the ground, and then the flow was decreased by the application known as a "seed bag," which is nothing more than a certain species of seed, confined in a bag, which bag, being pressed into the pipes by an ingenious process, so swells that the oil is by degrees subdued. When we arrived, Mr. Pettit was there—his eyes beaming with good-will towards himself and all creation. He told us that he had managed to insert a three-quarter inch pipe, and by this reduced the flow of oil to twenty-four barrels an hour. He was about to procure a regulator, with which he could increase or lessen the flow of oil.

Flett and Pettit's well is, doubtless, equal to the far-famed Shaw & Bradley's. On an average, from fifteen to sixteen hundred barrels per day could be obtained. It is a singular thing, that two days before the "flow," Mr. Petit would have sold his interest in the well for $1,200, but could not find a purchaser. It would now be impossible, for many thousand dollars, to make anything like a purchasing bargain with him as concerns his "territory."

MATHIESON & BLACK'S WELL.—This well, which created such a sensation a short time ago, has been emitting volumes of salt water for sometime past, though I now learn that the oil is again appearing. This salt fluid, when boiled down, produces an iron-gray powder, which tastes very much like saltpetre. A wicked fellow, who was with us, suggested that the powder, taken inwardly, might prove a cure for oil-fever. Shameful! No doubt that the oil will again burst forth; they have been boring deeper, and are confident of realizing their greatest expectations, and I join in that confidence.

OIL WELLS IN GENERAL.—So much has been said in every journal about the wells which were established as "flowing," some time ago, that I only think it necessary to say Mr. Bradley's and Mr. Shaw's are both as sound as ever, the former capable of supplying from 1,600 to 2,000 barrels per day. Some owners have left off boring, until the oil finds a ready sale. Whether or not this is wise, remains to be seen; for it seems natural enough that if the confined oil cannot find an egress at one point, it will gradually flow to some well which is in operation.

CAUTION TO SMOKERS.—Amongst our company was a gentleman much given to the use of the weed. Whilst at Pettit's well, he drew forth his pipe, and was about to strike a match, when a person near by held his hand in time to prevent and warn him. This was not mere carelessness, but blissful unconsciousness of the effects which would have been produced. Had the match ignited, the probability is that your correspondent, note book, boots, and apparel, would have found a lodge on some tree top half-a mile distant, but as the accident did not occur, I shall not draw on my imagination, but merely advise gentlemen to pocket their pipes on reaching the "wells."

M'CLEAN'S REFINERY.—This building is progressing, and being in the immediate vicinity of some large wells, a great business is likely to be the result.

ALLAN'S REFINERY.—We visited this refinery, and took great pleasure in examining the machinery used. Several improvements are to be made, by which the purifying process through which the oil must pass, will be rendered much less troublesome, and greatly facilitate its manufacture. One of these is a new method of supplying the boilers with oil. Formerly, to replenish the vessels, it was necessary, each time, to remove the cover. Now, a large vat is to be brought into communication with the boiler by means of a pipe, to which will be affixed a regulator, and thus oil can be supplied without constant manual labor, in such quantities as required. It is astonishing to see the substance which remains after the oil has been drained off—a cross between coal and coke—burning very much like wet powder, and, if left long enough, becoming quite hard. The blacksmiths prefer it for use, though a great deal is wasted. In a liquid, I have heard that it is superior to any kind of grease for cart wheels, and similar purposes; indeed, it should answer quite as well as tar for the roofs of houses. If some enterprising man was to buy it in, and also the heaps of sawdust at Mount Elliot, then mixing the two, allow them to harden, no doubt a large business could be done, for the substance would find a ready sale to those who advocate economy—and who does not? After procuring several samples of oil, we bade adieu to our friends, and left for the hotel.

PIPE JOINTS.—Mr. Lesourd has recently patented an improvement in joining pipes, communicated by Mr. Lemoine. The specification, filed by Mr. Henry, patent agent, Fleet street, describes the invention as consisting in fitting round the pipe junction, or contiguous ends, a hollow box consisting of two parts, hinged or otherwise held together; into which, when closed, a quantity of cement, luting, or other suitable agent, is run, so as to stop any opening that may occur at the junction. The box may be left on or removed: in the latter case, however, the cement is left round the joint. The box has feed and air openings. Sulphur is recommended as the plugging agent, to be used in a state of fusion.—*London Builder.*

THE AMERICAN GAS-LIGHT JOURNAL is published on the 1st and 15th of every month, and is the recognized official organ of

LIGHT, HEAT, WATER-SUPPLY AND SEWERAGE.

Its purpose is to ascertain and make known all new discoveries in the science and economical application of LIGHT, and promote thereby the interests of companies and consumers; to encourage and aid the introduction of PURE WATER from Lakes and Rivers into Towns and Cities, and to improve the system of SEWERAGE, VENTILATION, HEATING, and DRAINAGE everywhere.

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THE
AMERICAN GAS-LIGHT JOURNAL,
PUBLISHED ON 1ST AND 15TH OF EVERY MONTH.

PROPRIETOR, JOHN B. MURRAY. | EDITOR, C. ELTON BUCK.

THURSDAY, MAY 15, 1862.

Our esteemed progenitor, the London *Journal of Gas-Lighting*, seems to think that a terrible blow has been struck at the gas-lighting interest of this country by the Committee of Ways and Means, in placing a tax upon gas, and in a strain of virtuous indignation, thus refers to our remarks on page 280 of this volume:—

"The scheme of taxation proposed by the Government at Washington for meeting the costs of the war with the Southern States, and for payment of the interest on the debt incurred, comprises a tax on gas, equal to 1s. per 1000 feet, from which it is expected to raise £200,000 per annum In the present debased condition of the American press, no remonstrance is raised against this imposition of a tax on light, and our contemporary even boasts that 'the Committee of Ways and Means have done us the honor to consult the AMERICAN GAS-LIGHT JOURNAL, in forming the basis of their action.' In accordance with the subservient spirit that now pervades what profess to be the organs of public opinion, the same journal 'decidedly thinks that gas should be taxed as well as other luxuries.' It has been, hitherto, customary to consider gas a necessary of life and not a luxury. It is still so regarded in this country, and if it were proposed to tax gas, there would be an outcry against it from one end of the Kingdom to the other. Gas has not, indeed, been overlooked by our Chancellors of the Exchequer as a possible object of taxation, but the financial pressure must be great, indeed, to induce the making of such an attempt. The tax is regarded by our contemporary in America as an impost on the companies only, and he ventures to propose that there should be a discriminating duty apportioned to the rate of dividends of each; but taxes on articles of consumption, are always paid by consumers, and the effect of such a tax cannot fail to be a serious check to the progress of gas-lighting in the North American States."

Without replying to the gratuitous insinuations concerning the "debased condition of the American press," or the "subservient spirit that now prevades what profess to be the organs of public opinion," we think the prediction of our contemporary about as worthless as others of the same kind we have had occasion to quote; and quite as little likely of fulfillment, as the senseless assertions of RUSSELL, of the London *Times*. The immaculate wisdom of the latter caused him to foretell many dire calamities and excesses of the "mob," which have done not a little to mar his reputation as an observer of public character, and to consign his opinions to contempt. This ungovernable "mob," which he predicted would not submit to taxation, are now most anxiously awaiting the action of the House Committee, and willing to bear their full share of the burdens to be imposed upon them, whether in the shape of taxes upon "luxuries" or "necessaries." The sagacious editor of the *Journal of Gas-Lighting* said but a short time ago that the "promises and guarantees of the Federalist Government, are worth very little now, and will be worth less soon." With what wondrous perspicacity was this prediction made; and how soon the fulfillment of it is accomplished! At the time of this writing Government securities are firm at 3 to 4 per cent. premium, and gold is flowing freely into the National Treasury. So will it be with regard to the predicted "check to the progress of gas-lighting in the North American States."

We are told by the editor of the *Journal* if it were proposed to tax gas in England, "an outcry would be raised against it from one end of the Kingdom to the other." We fancy the word "outcry" here has a double meaning, and may denote something beyond a mere expression of dissent. But in this country no "outcry" is raised: gas consumers and gas companies with patriotic devotion to their Government in the hour of its need, will ever respond to the demands upon them, and time will show that the gas-light interest, although subject to taxation, will exhibit the same vitality as has heretofore characterized it.

While on this subject of taxation of "necessaries" we have some curiosity to know how long since the light of heaven was relieved from taxation in England by the exemption of windows from assessment? The same question might be asked in reference to a number of other articles, but, not wishing to be too digressive in our remarks, we refrain.

The question of public lighting has recently attracted considerable attention in England. Mr. RUTTER has written some letters to the *Journal of Gas-Lighting*, advocating the use of the meter on public lamps so as to secure a more equitable rate of payment than that under the contract system, now so much in vogue. Mr. HUGHES has lately taken the same ground in a series of papers which we have before transferred to our columns, and on page 213 of this volume, are illustrations of the proposed mode of attaching meters to the public lamps. Mr. RUTTER very properly asks the question—"Why should not public authorities purchase gas, and pay a fixed price for it in the same way as private consumers?" The same question has been repeatedly asked, but until recently, we have found no strenuous advocates of this method. Surely it is at once the most equitable, both to buyer and seller, and would redound to the mutual benefit of all parties concerned. As Mr. RUTTER says:—"After a little time, the lamps would be more numerous and better distributed, and the streets better lighted; the rate payers would understand in what way, and how much, they paid for gas; the private consumers would no longer complain of a disparity in prices."

On another page we publish from the *National Quarterly Review*, an article on Improvements and new uses of coal-gas. While assenting to the general tenor of the paper, we earnestly protest against the strange announcement that olefiant gas is composed of "two atoms of hydrogen and two atoms of charcoal." Such a method of popularizing science, by violating accuracy, and degrading philosophy to a level with the unlettered mind, is little better than travesty, and smacks too strongly of clap-trap to be tolerated even in a popular lecture. It might as well be said that coal-gas is composed of diamonds and hydrogen, or that black lead pencils are a component part of the illuminating agent to which the article is devoted. Although charcoal is essentially carbon, carbon is not necessarily charcoal, and any other of the existing forms of this element may be assumed quite as readily as the one in question.

It is a gratifying evidence of the advance in popular culture, to observe the increased attention paid to scientific and technical subjects by writers for the periodical press. Where, formerly, topics purely literary or scholastic in their nature were discussed, it is now quite common to find questions of the industrial arts examined, and the various applications of science receive a fair share of attention. The effect of this must redound to the better development of manufactures, and to a more extended acquaintance with the fundamental principles upon which their processes are grounded. Notwithstanding the contrary opinions of the ancient philosophers, the spirit of the present age owes much of its enlightenment to the beneficent teachings of science, which, in its manifold relations to the industry of man, has done so much for the elevation and refinement of the human race.

PATENT BITUMINIZED PIPES.—Mr. F. W. Bond, the agent for the London Pipe Company, has just received samples of this excellent pipe, and has executed large orders for it already. It is indestructible, incorrosive, and very much cheaper than iron. Mr. Bond's advertisement is on another page in this JOURNAL, to which he requests public attention.

CODE, HOPPER & Co.'s METERS.—Messrs. T. P. Code and William Hopper have associated with them Mr. Thos. C. Hopper, and continue the business of manufacturing gas-meters, &c., under the style of Code, Hopper & Co., at their old stand, No. 1504 Filbert st., Philadelphia. Attention is called to the letter of these gentlemen in another column, and also to their advertisement which appears in this number of the JOURNAL.

THE METROPOLITAN GAS-LIGHT CO.—This company, whose buildings have been lying unfinished during the winter, recommenced operations last month, and are pushing forward their works with great energy. The Metropolitan is the opposition company in this city, and is owned by wealthy and influential citizens, who are quietly but surely pushing their enterprise to completion. They promise to commence issuing gas to consumers by the end of this year, when a magnificent fight is promised by the old companies.

WARREN FOUNDRY AND MACHINE CO.—The following lines of pipe have been contracted for by the Metropolitan Gas-Light Co., of New York city, with this company:

8,344 feet	24-inch.	5,103 feet	20-inch.
2,625 "	16 "	18,922 "	8 "
3,255 "	6 "	103,236 "	4 "

to be coated with the pitch coating for pipes, and delivered within six months from the 15th May, at an average of $34 per ton.

The Jersey City Water Commissioners have, within the past week, extended their present contract with this foundry for 36-inch mains, 2,300 tons.

They have also received an order from the Hartford, Ct., Water Commissioners for a very fair line of 4, 6, and 8-inch pipes, and, from present indications, their present year's business will exceed that of 1861, which amounted to over 11,000 tons water and gas pipes.

The Warren Foundry and Machine Co. is at Phillipsburg, N. J. The post-office address is at Easton, Pa.

NEW YORK CITY.—The Croton Aqueduct Board have appointed William C. Rhodes, late State Prison Inspector, as Registrar under the Croton Board, in the place of Mr. Hance, deceased. This officer has charge of the collection of all the water rents of the Croton Department; it is, therefore, one of great importance to the city. The selection of Mr. Rhodes for this position has exhibited a desire on the part of the Board to place the important trusts of that office in trust-worthy hands. His record as a State officer is without a stain and beyond suspicion, and there is no doubt but that he will discharge his duties connected with this office with equal satisfaction to the public. Since the expiration of Mr. Rhodes' term of office as State Prison Inspector, he has been faithfully discharging his duties as a private citizen. During the formation of the Tammany regiment, he labored night and day, and left nothing undone that would add to the comfort of the soldiers who were leaving their homes for the camp field of the army of the nation. While others were receiving praise, he was content with knowing that he had done what his time and money could do to perfect the details of the regiment, and add comfort to the individual soldiers when in the tented field. His appointment gives universal satisfaction.

ANSWERS TO CORRESPONDENTS.

H. G., of Pa.—*The company you refer to has not yet gone into operation, but expect to commence work in a few months. We think their prospects are very good, although they will have to encounter a violent storm of opposition.*

S. J. P., of N. Y.—*There is danger of fire from spontaneous combustion, if the mineral is stored in heaps, and allowed to become wet. This is caused by the oxidation of the sulphur, which proceeds with such rapidity as to generate a high heat.*

L. E. T., of N. Y.—*Your letter has been received, and will be transmitted as you desire. The apparatus can be imported to order by several houses in this city.*

C. H. B., of Mass.—*The late reduction in the price of gas in Philadelphia, Pa., makes the virtual price to prompt paying consumers, but two dollars per thousand cubic feet. A discount has always been allowed by the gas company of that city, on bills paid within five days after presentation.*

E. W. S., of Conn.—*Clegg is the largest work; it is very complete, and copiously illustrated; but for your purpose Hughes would suit you better. The latter is a rudimentary work, and has the additional recommendation of cheapness.*

J. P. G., of Me.—*The* Journal of the Board of Arts and Manufactures for Upper Canada, *is published monthly at Toronto, C. W.*

R. L., of Ind.—*The water is not sufficiently pure for miscellaneous use, but is highly prized for its medicinal qualities.*

W. T. F., of Mich.—*We do not know the work you refer to, nor can we find out anything about it. It must be very scarce, if not entirely out of print. There are many recent books on the same subject, which are complete treatises, and which, doubtless, convey much more information than the one in question.*

J. J. P., of Cal.—*Will be glad to hear from you. We will publish an article in our next number which will give you some new ideas on the subject of your letter, and will be worthy of a careful study.*

J. B. H., of Md.—*There was a talk of abolishing the office of Inspector of gas-meters in this State, but whether the Legislature really intended to do this, or whether the report originated only in idle gossip, we do not know. We have often expressed our opinions of the importance of the office.*

J. H. P., of N. Y.—*The opinions of scientific men have been divided as to the propriety of salting the streets in winter to effect the removal of snow. The subject has been discussed during the past winter in Philadelphia, where the practice is everywhere tolerated, and more recently by the Polytechnic Association of the American Institute, in this city. In Philadelphia, the practice was defended by several chemists, much to our surprise. We think it very prejudicial to the public health, and deserving the severest condemnation. We oppose the views of those defending the practice* in toto. *At the Polytechnic meeting the opinions of Dr. Sayre, and others, were much more in accordance with the truth, and we hope, under such teachings, the practice will be discontinued.*

B. W., of Pa.—*You had better write to the builders of the works, who have all the data, and can answer your questions promptly.*

E. W. C., of Ohio.—*Your explanation seems paradoxical, and yet it is true. There are some strange phenomena connected with investigations such as those you are engaged in, but this very strangeness adds interest to the study. We would like to hear your results when you shall have completed your experiments.*

CORRESPONDENCE.

Code, Hopper & Co.'s Meters.

Philadelphia, Pa., May 10th, 1862.

To the Editor of the American Gas-Light Journal:

In your issue of Thursday, May 1st, 1862, on page 329, you announce that the old firm of Code, Hopper & Gratz, meter manufacturers, of Philadelphia, has been dissolved, and has been succeeded by that of Robert H. Gratz & Co.

As this is likely to give a wrong impression, viz., that of our retirement from the business, we ask that you will be kind enough to state that the old firm of Code, Hopper & Co., composed of T. P. Code and William Hopper, the old partners, continue the business at the old stand, No. 1504 Filbert street, Philadelphia.

Yours, truly,

Code, Hopper & Co.

Detroit, Mich.—The number of gallons of water consumed in the city of Detroit during the year 1861, was 895,129,423, against 870,036,451 gallons consumed in 1860. The average daily consumption in 1861 was 2,452,409 gallons, being an increase over the daily consumption of 1860, of 68,748 gallons.

THE GAS-WORKS OF LONDON.

BY ZERAH COLBURN.

(*From the London Engineer.*)

(Continued from page 326.)

The setting of retorts is a matter of much importance, the object being to secure a high and uniform heat upon all the retorts in a bench with the least expenditure of coke in firing. A Mr. Rackhouse is said to have been the first, and as long ago as 1815, to introduce the plan of setting each nest of retorts in an oven, the plan now invariably adopted in all the gas-works of London. With the long retorts now used, these ovens may be described as tunnels about 18 feet long, 6 feet or 7 feet wide, and of a height corresponding to the number of retorts to be enclosed. The arch or crown of the oven is semi-circular, or semi-elliptical, and is turned in fire-bricks, of which, also, all the surfaces exposed to the heat are formed. The floor is laid over ordinary brick-work, beneath which a coke pit is formed in many works, as at the Chartered, Phœnix, and several others. In the newer works, however, and generally, indeed, where the value of space is not excessive, none of the brick-work extends further below the floor of the retort house than is necessary to secure a good foundation. The furnace for firing the retorts is made at each end of the oven or tunnel, the grate being proportioned to the work to be done, a width of 15 inches and a length of fire-bars, in each furnace, of about 2 feet or 30 inches, being a common allowance for a bench of seven retorts. Over the fire-bars is generally turned a small arch of fire-bricks, the heat being led off on each side to act upon the retorts, around which it circulates in rising between the numerous partition walls previously described. The upper and lower retorts are separated from each other, for their whole length, by fire-bricks or tiles, the heat being seldom allowed to act directly upon the bottom of a retort, but more generally upon the sides and upon the top, where the heat is reverberated from the underside of the crown of the oven. After the retorts are in their places, the ovens are closed at both ends by brick-work built in and around the retorts, and out to the sides and top of the oven. The heat from the furnace, after rising on one side of a vertical tier of retorts, generally descends down the other side, what is left escaping into a flue below, which is in communication with the chimney stalk. With clay retorts the heat is generally such that an iron damper in the main flue would be melted in a short time, and hence fire-clay dampers are employed. Even the chimneys, where built of common bricks, are generally cracked by the heat, and in one of the most recent gas-works in the neighborhood of London—that of the Crystal Palace District Company—the chimney has been made of fire-brick throughout; the circular shaft, 14 inches in thickness all around, being formed of radial bricks, bonded together at intervals of the height of the shaft, by rings of large fire-brick segments 4 inches thick.

The sidewalls and arches of the furnaces (not those of the ovens) are frequently burnt out in from three to six months, although they may last for a year. The setting is generally such that they can be renewed without disturbing the retorts. The durability of the retorts has already been touched upon. Three years is perhaps a fair lifetime for clay retorts worked at a high heat. The inner walls of the ovens should last for a number of years, say eight or ten. Whenever they require rebuilding, everything set up within the oven must, of course, come out.

It is customary to tie the brick-work of the retort benches together, both in the direction of the retorts and along the length of the retort house, by tie bolts, taking hold of "buck staves" or clamps. With iron retorts there is, of course, considerable expansion on their first being heated, and it is well known that, under the action of heat, cast-iron dilates permanently—a cast-iron fire-bar, for example, gradually extending half an inch or more in length, although its elongation under any one heat may not amount to nearly as much. A 20-foot cast-iron retort becomes, in this way, permanently elongated by from 3 inches to 5 inches, and its outward thrust in this expansion must of necessity be great. With clay retorts, however, especially if the clay be of a kind which does not increase in bulk on being heated (most clays contract by heat), there is little or no disruptive strain upon the brick-work, and at the Crystal Palace District and other gas-works, Mr. Christie has entirely dispensed with tie bolts and buck staves.

The cast-iron mouth-pieces, upon which the sockets for the ascension pipes for conducting away the gas are cast, are generally fastened to the ends of clay retorts by bolts, which project from the clay through holes left for that purpose when the retort is moulded. Mr. Hughes, in his little work on gas-making, says: "In preparing the end of the retort to have the mouth-piece attached, the end surface is chipped and notched with grooves like the surface of a millstone, in order to retain more firmly the cement filled in between the retort and the flange of the mouth-piece. The cement used is the ordinary iron cement, compounded with sulphur, and mixed with an equal quantity of fire-clay. This mixture, made into the consistence of mortar, is spread evenly over the joint; the mouth-piece is then attached and screwed up, the recesses in which the bolts are sunk being filled with the same mixture."

For fire-brick retorts, socket mouth-pieces enclosing the end of the retort are used at the Chartered Gas Company's works, and at those of the South Metropolitan—that is to say, the end of the retort extends into a socket 4 inches or 5 inches in depth, cast upon the back of the mouth-piece, and generally three or more mouth-pieces with these sockets are cast together upon a single plate, which is held, by tie bolts, against the brick-work. At some other gas-works, where brick retorts are used, the mouth-pieces are made without sockets. The sockets would, perhaps, be found advantageous, even with ordinary clay retorts. Cases have been known where the expansion of the ascension pipes (through which the gas rises from the retort) has been such as to lift the hydraulic main off its supports. In such a case a great strain must necessarily be thrown upon the mouth-piece joints, where a socket would afford great resistance against starting the bolts.

The mouth-pieces, and thus the ends of the retorts, are closed by iron lids, either cast or wrought, the latter being preferable and in extensive use. Through a couple of ears, one on each side of the mouth-piece, two studs project outward, and through two slots, one in the outer end of each stud, a cross-bar is so placed as to be capable of ready removal. By a stout screw passing through the cross-bar and pressing against the centre of the lid, the latter, previously luted with wet lime, is made gas-tight.

We may now stop to examine the working of the retorts. Presuming that everything is in readiness, they are first gradually heated for a number of hours, this process sometimes lasting for a whole day. The coal having been wheeled into the retort house, on both sides of the great main range of benches, so that the men can charge simultaneously at both ends of the retorts, the charging scoops are first filled. The scoop is of sheet iron, not far from 10 feet long, and of a size convenient for being run into and turned over in the retort, by means of an iron stalk with cross handles at the outer end of the scoop. About half of the coal intended to be charged at one mouth-piece is shovelled into the scoop, which is then lifted, run into the retort, there turned over, and immediately withdrawn, leaving the coal behind. A second scoopful being charged, the lid, previously served around the edges with wet lime, is applied—the cross-bar having been previously slipped into its place—and, by means of the tightening screw, a close joint is quickly made. The other end of the retort being similarly and simultaneously charged, the coal, already in course of decomposition, sends off its gas into the hydraulic main above.

The amount of coal charged at a time, at one mouth-piece, varies in the different London gas-works from 170 lbs. to 280 lbs., or from 340 lbs. to a quarter of a ton to one long retort. From 196 lb. (1¾ cwt.) to 224 lb. is the more usual charge for 16-in. retorts. Thus, when charged every six hours, the carbonising power of the 340 long retorts at the Horseferry road station is about 300 tons, or possibly 320 tons a day, and the 350 retorts (700 mouth-pieces) at the Goswell street and Curtain road works will get through 350 tons a day. With nearly 600 long retorts at the Pancras station of the Imperial Company, about 500 tons can be carbonised

daily, and we believe that, at the Hackney road station of the same company, upwards of 425 tons of coal have gone through 386 retorts in a day of 24 hours. At the London Gas-Works, too, we understand that about 300 tons of coal have been carbonised in one day, in 250 retorts. At the City Gas-Works, and at the Commercial works, 1,700 tons a week is about the maximum carbonising power of each, although the former has 940 and the latter but 540 mouth-pieces. At the Vauxhall station of the Phœnix Company, at the Great Central, and at the Equitable works, the maximum is about 1,100 tons each every week. In every case the retorts are charged every six hours. At the Western Gas-Works, however, where only cannel gas is made, a considerable number of the retorts are worked on four-hour charges.

For working the retorts it is customary to divide the men into gangs of five each. Three of these, who attend the retorts, are called carbonisers or stokers, a fourth keeps up the fires in the furnaces, and the remaining man wheels the coal and coke in a barrow. To one of these gangs from 42 to 56 mouth-pieces are allotted, 50 being the number at the Goswell street works, and 56 at the Crystal Palace District works. This allotment of mouth-pieces is not always in the same range of benches, and it sometimes happens that the men have to go from one retort house to another to serve their full number of retorts The men work 12 hours at a shift, for seven days in the week, with the exception of one, and sometimes two, Sundays in the month. The work is trying, especially when "drawing" or raking out the retorts, but this severe work is not continuous, the men having more than half of the whole time for rest. Thus, for every bench of 7 retorts, or, rather, 7 mouth-pieces, at least three-quarters of an hour are allowed for charging and drawing, whereas it is not unusual for the work to be over in from 15 to 20 minutes. In the hottest of the work the men frequently strip to the waist, and many will, while reeking with perspiration, stand under the open louvres in the roof, no matter how strong the draught. At many of the works the men are provided with an unlimited supply of a drink composed of oatmeal and water "skilly," and of which the carbonisers at the Chartered Gas-Works (Horseferry road) are found to consume an average of seven quarts each a day, so great is the thirst occasioned by their work. One of the men at these works while incautiously drinking freely, not long since, of cold water when overheated, dropped dead to the ground.

The pay of the head stoker of each gang of men is generally about $8 a week (of 7 days), the other two stokers working under him receiving, say $7.25, although the pay is not always as high as this. The firemen and coal-wheelers are usually paid about $5.75. In the winter time, when the daily production of gas is nearly or quite four-fold what it is in summer, a gas-works with 300 long retorts would give employment in all to about 300 men, one-half working by day and the other by night. In the winter, therefore, between 4,000 and 5,000 men are employed in the nineteen gas-works of London. In the spring, when the demand for and consequent production of gas begins to fall off, a large proportion of the stokers seek employment in the neighborhood of London and in the country, generally in brickmaking. At this trade they will work all the summer, returning in the fall to their former place of employment. Many of the managers of the London gas-works can point out men who have worked for them in this manner, or "off and on," for ten or a dozen years. At some of the works, as at the several stations of the Phœnix Company, rooms are fitted up for the use of the workmen in the intervals between "charging" and "drawing." At the Bank-side station of the Phœnix Company there is a library of a few hundred volumes, and a daily newspaper, as well as several weeklies, are taken in for the use of the men. Good baths are also fitted up for their free use, after working hours. The library and the baths were also set up at the extensive Vauxhall station of the same company, but it appears that all the books, lead-pipe, and brass cocks gradually disappeared, until nothing was left. At the Hackney road works of the Imperial Company, Mr. Clark has recently fitted up eight baths hardly inferior in any respect to those of a first-class hotel, and we sincerely hope, for the welfare, as well as the credit of the men, that the fittings will be better respected than they were at Vauxhall.

The production of gas commences the moment the coal is within the heated retort, and before the men can secure the lid a greater or less body of flame appears at the mouth-pieces, characteristic of the energy with which coal-gas enters into combustion with air. The quantity of gas obtained from a ton of ordinary gas coal is commonly within the limits of 9,300 and 9,500 cubic feet, although if the distillation were continued beyond the usual period of six hours an additional quantity of gas would be obtained, but of inferior illuminating power. At the Surry Consumers' Works, where the retorts are not worked at as high a heat as is adopted at some other establishements, we are informed that the yield of gas is somewhat below 9,000 feet per ton, the illuminating power, however, being rather above the average. This difference in the rate of production is believed to be due to the mode in which the retorts are set and worked. As described in our last number, the retort benches at Rotherhithe are in two stages, the fires, which are made to act first on the upper stage of six clay retorts, descending afterwards to eight iron retorts below. This arrangement is found to be economical in respect of the quantity of coke consumed in firing, for, whereas, in all, or nearly all, the other gas-works in London, one-third of all the coke, left after the distillation of the gas, is burnt under the retorts, only one-fourth of the whole quantity of coke made is burnt in the Surrey Consumers' Works. The coke left on the distillation of a ton of coal is usually one chaldron of 36 bushels, weighing between 13 cwt. and 14 cwt., or about two-thirds of the original weight of the coal before it went into the retorts. Thus, in the majority of the gas-works in London, one-third of 13½ cwt. or 4½ cwt. of coke is burnt under the retorts for every ton of coal carbonised, the other two-thirds of all the coke being sold at the rate at say 11s. a chaldron, equal to from 16s. to 17s. per ton. At the Surrey Consumers' Works, therefore, hardly 3½ cwt. of coke is burnt for every ton of coal put into the retorts, 10 cwt., or three-fourths of a chaldron, remaining for sale. Every hundredweight of coke saved is worth 10d., but if the saving is attended with a loss in the production of gas, of say 250 feet, worth 13¾d., the economy must be altogether illusive. It has been said that when Mr. Croll's system of combined clay and iron retorts was in use at the Great Central Consumers' Works, the expenditure of coke was sometimes as low as one-eighth of the whole quantity made, or about 1¾ cwt. only for every ton of coal carbonised. However this may have been, and whether or no an average production of gas was obtained, the system has been abandoned, as it is likely to be, also, at the Surrey Consumers' Works at Rotherhithe.

The heat on the retorts is commonly maintained between a cherry red and a bright orange, clay retorts being heated considerably above the temperature corresponding to a cherry red heat on iron. By means of sight holes, opening through the brick-work between the retorts, as also by the appearance of the retorts themselves, when opened for the purpose of drawing the charges, the firemen are enabled to judge of their temperature and to regulate their fires accordingly. At the Imperial Gas-Works, at least, at the Hackney road station, the coke is fed red hot from the retorts into the furnaces, although at most gas-works all the coke is quenched.

Our readers will hardly require to be told that, besides gas, tar and ammoniacal liquor are produced in the retort during the distillation of the coal, and carried over into the mains and vessels into which the crude gas first passes. A ton of Newcastle coal will yield, in the ordinary course of gas-making, about ten gallons of tar and an equal quantity of ammoniacal liquor. From cannel coal the quantities of each are about 14 gallons, the yield of gas being 11,500 cubic feet per ton; and from cannel-tar, naphtha is distilled. We shall have occasion, however, again to refer to the treatment and value of the residual products in question.

"Drawing" the retorts, at the end of every charge, is simple enough, but in consequence of the heat it is a severe task for the men. At the end of the proper period of distillation, generally six hours, the lids are removed simultaneously from both ends of each bench, the first access of air being attended with the explosion, in a voluminous flame, of the gas remaining in the retorts. The incandescent coke, much enlarged from the original bulk of the coal, and cohering in a single mass, has then to be quickly broken up and raked out upon the retort-house floor, iron rakes with long handles being employed in the work. The return of gas to the retorts is prevented by the self-sealing apparatus in the hydraulic main, to be presently described.

Before leaving the retorts we may notice that the formation of carbonaceous scurf upon their internal surfaces, once the cause of so much trouble in gas-works, is now greatly lessened, possibly in consequence of the general use of exhausting apparatus, whereby hardly any pressure is now maintained in the retorts above the ordinary pressure of the atmosphere. With retorts worked under a high pressure, the deposition of carbon goes on rapidly. The use of double retorts, opening at both ends has, furthermore, tended to prevent the accumulation of scurf, as, while the retorts are open for drawing the charging, the uninterrupted flow of air from end to end promotes the combustion of the carbon, thus keeping the internal surfaces of the retorts tolerably clear.

We may now follow the gas in its progress from the retorts to the condensing and purifying apparatus. The stand-pipes, or ascension-pipes, from 4 inches to 6 inches in diameter, rise from the mouth-pieces as already explained, a socket being cast on each mouth-piece, in which the stand-pipe is secured by a rust joint. There is almost always a stand-pipe rising from each end of a double retort, although, in a few works, all the gas made in a 20-foot retort has to find its way out at one end. Where cannel gas is made a good deal of pitch is deposited on the insides of the stand-pipes, and at the Western Gas-Works, where the retorts are charged every four hours, the stand-pipes need clearing out every time a charge is drawn.

By proper connections the stand-pipes, which rise 5 feet or 6 feet above the top of the bench of retorts, are bent over and downwards so as to enter the hydraulic main, a tube from 18 inches to 30 inches in diameter, and extending for the entire length of the retort-house, sometimes in front of the stand-pipes, but more commonly behind them. Over a very large number of the retorts at the Pancras station of the Imperial Gas-works a single hydraulic main extends along the middle of the long range of benches, communicating with the ascension-pipes from both ends of each retort. At the Surrey Consumers' Works a single main is also used along the middle of the contiguous benches. This plan is not to be recommended, however, as if the main becomes obstracted, the whole works are stopped; whereas, with two mains to each range of retorts, the whole work can be thrown upon one while the other is being cleared out or repaired. In making cannel gas, at least at the Western Gas-Works, the mains become choked with pitch in three or four months; whereas, with Newcastle coal, they would not require clearing out oftener than once in as many years. The use of a single main, therefore, in a cannel gas-work, would be attended with some inconvenience, and the long inclined ascension pipes, also required in that case, would cause additional trouble.

The hydraulic main was formerly made of cast-iron, and many cast-iron mains are still in use, and possibly some gas-engineers still prefer them. They are now however, very commonly made of wrought-iron plates, ⅜-in. in thickness. The Phœnix Company was among the first in London to employ wrought-iron mains. Theirs are 2 feet in internal diameter, being circular in section, with the exception of a flat seat at the top for the attachment of the dip-pipes. At the Equitable, the Commercial, the Great Central, the Western, the Crystal Palace District, and, perhaps, at some others of the London gas-works, wrought-iron hydraulic mains are also adopted. The main at the Western Gas-Works is made square in section, with removable doors or lids on the back to allow of clearing out the pitch, the rapid deposition of which has already been noticed.

The hydraulic main is half filled, at first, with water, which is retained by a plate or weir fixed in the ends of the main in such manner that, upon any addition to its liquid contents, the excess flows over, through a descending pipe, into a collecting vessel below. The tar brought with the gas from the retorts soon displaces

a part of the water, and sinks to the bottom of the main, the ammonia uniting with the rest and floating on the surface, as ammoniacal liquor. Ammonia is a gas formed by the combination of nitrogen with hydrogen, both constituents existing in coal. Water absorbs ammonia with great avidity, and thus it is that the greater part of the ammonia produced in the distillation of gas coal is arrested in the hydraulic main.

The dip-pipes enter the top of the main through a tight joint and descend until their open mouths are 2½ inches or 3 inches below the level of the ammoniacal liquor in the main. Thus the gas can only enter the main by displacing the liquid which otherwise would rise in the pipe to the same level on its inside as on its outside, and thus, too, when once in the main, the gas cannot possibly return to the dip-pipe. This simple arrangement was devised, we believe, by the late Mr. Clegg, and it does its author great credit. Known as the water joint, it is applied in the greater number of vessels employed in gas-making, the tar-trap, the condensers, the purifiers, and the gas-holders, in all of which the gas is retained without the possibility of escape by the simple interposition of a few inches of water between the edge of one pipe or vessel and that of another surrounding or enclosing it.

From the hydraulic main to the condenser the gas passes simply through a pipe in connection with a tar-trap for retaining the tar and ammoniacal liquor.

In most of the London gas-works the gas passes from the main at once to the condenser, and afterwards to the exhauster, but at the City Gas-Works, the London, the Phœnix, the South Metropolitan, and, possibly, some others, this order is reversed, the gas being exhausted directly from the main. At the several stations of the Chartered Gas Company both the condensers and scrubbers are placed between the main and the exhausters. We will, then, glance first at the condensers, in which the gas drops the tar and ammoniacal liquor, or as much of it, at least, as escapes deposition in the hydraulic main. No one who has been over the nineteen gas-works of London would suppose that there was any sort of rule for the proportion between the condensing surface and the quantity of gas in motion. Something like five square feet of surface for every 1,000 feet of gas made in twenty-four hours has been insisted upon by some engineers; but others, we believe, manage with less than one-fourth of the surface which this rule would allow. The greatest differences exist, also, in the mode in which the condensing surface is employed to cool the gas. Thus, at the South Metropolitan works, a circuit of perhaps 120 feet or 150 feet in length of 10-inch pipe is carried to and fro in a cistern of water so intersected by partitions as to produce a gentle flow of water in a direction opposite to that in which the gas is moving. The principle is the same as that of the refrigerators used by brewers for cooling worts. At all the other works vertical condensing pipes, exposed to the atmosphere, are employed, but in occasional instances, as at the Great Central and the Crystal Palace District works, hollow pipes are employed, with the air circulating both outside and inside an annular space; and at many works water is allowed to drip over the pipes, at least, while the sun is out. The pipes are generally coated with gas tar, both as a protection against rust, and because a black color is best for a rapid radiation of heat. At the Pancras station of the Imperial Company the condenser consists of 10 columns or pipes, each 3 feet 6 inches in diameter, and painted red. There is, we are told, no internal air-pipe, and water is allowed to trickle over the condenser while the sun is out. We believe that the whole make of gas at these great works, sometimes amounting to nearly 5,000,000 cubic feet in 24 hours, passes through this condenser, although its surface, we should suppose, hardly exceeds 3,500 square feet. There are many gas engineers who now object to a rapid condensation of the gas, on the ground that more of the carbon is likely to be percipitated as tar, and the gas thereby impoverished. This view is taken, at least by engineers engaged in cannel gas-making, and we believe it is shared to some extent by makers of ordinary gas.

The tar reservoirs below the condensing pipes are variously made. Sometimes, as at the Ratcliffe Gas-Works, a separate box is provided for each pair of pipes, but, more commonly, a long box is divided by partitions reaching down nearly to the bottom, the tar contained in the box preventing the direct passage of gas from one division to another. The condensing apparatus which, properly performing a given amount of work, and having ample strength and durability, weighs the least, is, one would suppose, the best. The pipes are generally made as thin as they can be safely cast, and the tar-boxes require but little more strength than suffices to prevent their being broken by accidental blows. The surface of the tar reservoir itself assists the cooling of the gas, but it is desirable to keep it of a moderate size. With thin castings, the partitions cast in to compel the gas to traverse the full circuit of the pipes no doubt afford a desirable stiffness to the boxes, but otherwise the condenser at the London Gas-Works, Vauxhall, would be the simplest and, perhaps, the most preferable of those not having internal air-pipes. Here the bottom box is made without division plates, each pair of pipes being connected, in the open air, by a bend, from which a short pipe descends and passes through the cover of the box, well into the tar within.

In some of the old condensers, with two parallel circuits or rows of pipes, the gas going first through one row and returning by the other, the juxtaposition of a warm and a cold pipe upon the same division of the bottom box has been found objectionable, and hence, where two parallel rows of pipes are used, it is now preferred to take the gas up one pipe in one row and down another in the other row, so that the two pipes rising from any one division of the tar-box may have, as nearly as may be, the same temperature.

All the joints about the condenser are made with flanges where required, the pipe joints being spigot and socket, made either with iron rust well caulked, or with yarn and lead.

Those who are familiar with the mode of heating the blast for iron furnaces, might be disposed to wonder at the comparatively low temperature imparted to the gas by the vast extent of highly heated surfaces of the retorts. In the heating ovens of blast furnaces a million cubic feet of air are often heated every hour to a temperature which will "cut lead," and it is occasionally the case that the air-pipes beyond the ovens become heated by the passing blast to a dull red. But, in a range of 150 long retorts, making little more than 50,000 cubic feet of gas per hour, and yet exposing several thousand square feet of surface heated with, say one ton of coke every hour, the temperature of the escaping gas is such that it is often drawn from the main directly through the exhauster, without the least injury to the finished surfaces and delicate spring packing of that apparatus. In many of the condensers, too, even when placed between the main and the exhauster, the socket joints are made with tarred yarn and lead. The explanation of this moderation of temperature in the gas is to be found in the fact that, in the conversion from the solid to the aeriform state, a great amount of heat becomes latent. Were the retorts filled with air, it would soon become excessively heated, and a red heat on the mouth-pieces, lids, and even the ascension-pipes, would be a matter of course. But as soon as a portion of the gas already formed in the retort becomes hot, its heat is in a great measure absorbed by the nascent gas at the same instant issuing from the pores of the coal, and thus the temperature is constantly kept down to a point much below what might be expected if the amount of internal heat applied were alone considered.

(*To be concluded.*)

Gas Explosion in London, England.—The London *Journal of Gas-Lighting* gives the following account of a singular gas explosion which occurred in London on April 16th:

Very serious damage and fatal injuries were occasioned by an explosion of gas, on Wednesday afternoon last, under circumstances previously unheard of. The London Gas Company were laying a twelve-inch main by the side of the foot pavement in High Holborn, and the plan adopted in doing so was to add separate lengths, about fifty yards long, to the main already charged with gas. The end of the charged main was bladdered until the length jointed to it was drilled and tapped, and the requisite service pipes connected. In this manner the workmen had proceeded safely until they arrived opposite the premises of Mr. Hulett. An additional length had been added to the charged main, and a hole had been drilled and tapped, and the tap removed, leaving the hole open. As the end of the charged main was bladdered, it was supposed there could be no escape of gas; but there must have been either some defect in the bladder, or it was not sufficiently distended, for a quantity of gas leaked into the added length of main, the end of which had been plugged up. The gas escaping through the open hole was ignited by the fire of a portable stove used by some workmen who were soldering the pipe of a water service, and a terrific explosion took place within the main, the further end of which burst like a bomb-shell, and large fragments of it were forced, with great violence, in all directions. Two of the workmen were killed; several others were wounded; the front of the stationer's shop, at the corner of Featherstone Buildings, was completely destroyed, and the upper windows were shattered. Some damage was also done to the adjoining premises; but the effects of the explosion were principally confined to one house. It is very remarkable that it was only the farther end of the new main that was burst asunder; the parts nearer to the junction with the charged main not having been injured. It appears from this circumstance that the gas must have leaked very freely into the added length of main, and that the proportion of gas to atmospheric air near the junction was too great to be violently explosive; whilst, at the farther end, where there was a less proportion of gas, it had combined with the air to form an explosive mixture of the greatest force. We notice the accident thus prominently as an instance of the extraordinary risk to which gas companies are liable in carrying on their operations; and as a caution against placing too much reliance on the efficiency of bladdering in mains of large diameter. The London Gas Company accepted their responsibility without hesitation, and at once offered to make ample compensation to all persons whose property had been injured by the explosion.

Gas in Australia.—The Sydney *Morning Herald* mentions that the half-yearly meeting of the Australian Gas-Light Company was held on February 19th, at the company's office in Sydney—the Hon. James Mitchell in the chair. The report was read by the secretary and unanimously adopted. A dividend of 5 per cent. was declared, with a bonus of 2½ per cent. Mr. J. L. Montefiore was elected a director in the place of Sir Charles Nicholson, Bart., who has gone to England. The report stated that since the previous general meeting, the second gas-holder at the Haymarket station had been completed, and brought into effective operation, and that the company are now in a position to supply gas to the whole of the suburbs of Sydney, so far as the consumption would give an adequate return. The company had reduced the price of gas and the charge for rent of meters, from the commencement of the present year; the reductions being on gas consumed by meter, 2s. per thousand cubic feet, or from 15s. to 13s. per thousand. On inside lights burned by contract, 10 per cent.; corporation lights, and those for suburban municipalities, from £10 to £9 per light per annum; and, on the charge for rent of meters, about 24 per cent. It was mentioned in the report that, in order that the quality of the company's gas might be ascertained by competent and disinterested investigation, the directors had engaged Mr. Charles Watt, of the Sydney University, to make experiments thereon from time to time, and report the results arrived at. Mr. Watt had already sent in three reports, all of which were very satisfactory, showing that, as regards both specific gravity and illuminating power, the company's gas was equal to the average of that made in England.

Gas Explosion in Brooklyn, N. Y.—An explosion of gas occurred on Thursday evening, May 1st, at the store of Mr. McKage, 397 Myrtle avenue, by which he wasbadly burned about the face and hands. The burners had been turned on during the day and the room became filled with gas. Mr. McKage went into the room with a lighted lamp, when the gas ignited and an explosion occurred, the force of which blew all the glass from the windows.

PETROLEUM ITEMS.

Oil City Weekly Oil Report.—Our regular reporter is absent this week. We have but little change to notice. There has been considerable activity among shippers, and large amounts have gone forward. Nearly two-thirds of the amount shipped, is on account of previous contracts. There is a fair supply of buyers in market, and we have no change to note in prices since our last report, viz: 50 and 60 cents per bbl. at the wells, according to quality. The eastern oil market is in an unsettled condition, and we have no reliable quotations to give. Future prospects begin to brighten up.

We give below the amount of oil received and shipped at our warehouses, for the week ending April 8.

Michigan Rock Oil Company.—Received 4,516 barrels oil; shipped 4,173 barrels oil; received 2,654 empty barrels.

Abrams, Orr & Co.—For last two weeks, received 5,712 barrels oil; shipped 6,134 bbls; received 3,687 empty barrels.

R. D. Cochran & Co.—Received 1,430 barrels oil; 736 empty barrels; shipped 2,112 barrels oil.

Hanna's Warehouse.—Received 2,820 barrels oil; shipped 2,992.

Production in the Venango, Pa., Oil Region.—We learn that there is considerable inquiry abroad, as to the amount of oil produced in the Venango oil region, and the permanence of the supply. It has been stated heretofore that our wells are capable of producing 200,000 barrels a month. From all the information we can gather, this is rather under than over the mark. Hardly one-third of the present oil territory has been developed as yet, and there is no mining going on at this time. If the oil could be sold at prices that would justify, a much larger amount than this could be produced. Parties wishing to buy quantities of say 50,000 to 100,000 barrels, and are willing to pay a fair price, can have those amounts delivered at the mouth of Oil Creek, within ninety days from the date of contract. So pay us a visit, gentlemen, and our oil men will sell you as much oil as you want to pay for.—*Oil City Register.*

The Canada Oil Trade—New Tariff.—We are happy to state that, in compliance with the representations of a large number of oil men, the Great Western Railway Company has arranged a tariff for the carriage of the oil East on a very liberal scale. Persons engaging cars can have the oil shipped at the following rate:

	Per Barrel.
From Wyoming to Montreal.....	$1 25
" " Quebec.....	1 37

Each car will take 58 barrels. The fixing of the rates to the places of shipment, will enable dealers to make their calculations with greater accuracy than they have hitherto been able to do. The effect of the tariff will be to divert the oil from the lakes and canals to that of the railway.—*Canada Free Press.*

Oil Shipment Direct to England.—The new and profitable branch of commerce (we allude to the oil business) is likely to be established between Canada and Great Britain during the coming summer. We understand that the bark *Prince of Wales*, owned by Messrs. Norris & Nelson, has been chartered to proceed from Sarnia for Liverpool direct. She arrived at Port Sarnia on Monday, and yesterday commenced to take in her cargo, which will amount to 3,000 barrels of oil. Messrs. Thompson & Co. will fill up with staves, to the number of about 2,000. When loaded, she will at once proceed to her destination across the broad Atlantic. If this trip should prove successful, and there is little doubt that it will, a very extensive trade will be the result. The oil is in great demand in England, where any quantity of the article can be readily disposed of at good prices.—*Canadian Free Press.*

Oil Rafts.—Oil is sent down the Allegheny river from Oil City and Tidioute in boxes. They are made tight, 16 by 1¾ feet, and are filled from the wells or tanks along the creeks; twenty are fastened together to form a river fleet. This fleet is run to Pittsburg, where the oil is put into barrels and forwarded to market.

A Rival of Gas.—It is said a plan is about to be brought into use in the East by which petroleum can be converted into first-rate illuminating gas, at a cost of about fifty cents per thousand. If the statement is correct, we will soon witness a revolution in the business of illumination that will place a most effectual check on gas monopolies. No other corporation, chartered for any purposes whatever, not even mammoth railroad companies, enjoy the same independent monopoly as gas companies. An association which puts up a so-called "gas measure" in your cellar, keeps its own accounts of the register, admitting no error or contradiction, and shuts off your supply of gas at its own will and pleasure, is not likely to become popular, even with green old age, and the evil is none the more endurable because there is no remedy. Thousands, then, will rejoice in the success of the petroleum gas. —*Am. Railway Review.*

We imagine gas companies will be able to withstand such insinuations as our neighbor of the *Review* is pleased to make. The sneer against the gas-meter comes with a very bad grace from a journal which has strenuously advocated the introduction of the water-meter, which would be under quite as exact a scrutiny by water companies as gas-meters are by gas companies. Perhaps the *Review* will be good enough to tell us how the latter corporations should regulate their affairs, so as to please all grumblers.

Gas-Light in the Navy Yard.—Gas-pipes have been laid round the dry dock in the Brooklyn Navy Yard, and lanterns fixed in the shed convenient to it. From this, it may be inferred that work is to be pushed along night and day.

PATENTS.

UNITED STATES.

34,964.—H. C. Hutchinson, of Cayuga, N. Y., for Improvement in Lamps:

I claim the device of a perforated guard or screen, to be placed upon or within the central flue of a kerosene lamp, by which the lamp is better enabled to hold the flame.

34,908.—Abiel Pevey, of Lowell, Mass., for Improvement in Casting Gas Retorts:

I claim the flask constructed as described, when combined with the carriage or truck and its arm, J, and brace, L, pins K and O, or their equivalents, in the manner described, for giving all the required movements and positions to the flask, with the greatest ease and precision, for the purposes fully set forth.

34,984.—Joseph Ridge, of Richmond, Ind., for Improvement in Coal Oil Lamps:

I claim, first, The mechanical device, M, constructed substantially in the manner and for the purpose set forth.

Second, I claim the diaphragm, D, made and applied as described.

And, third, I claim the combination of the device, M, diaphragm, D, and short chimney C, constructed and arranged substantially in the manner shown in Fig. 1, and for the purpose described.

34,985.—H. C. Sergeant, of Cincinnati, Ohio, for Improvement in Gas Regulators:

I claim the application of an adjustable screw, placed in one end of the key of a gas cock, so arranged as to control the amount of opening in the key, as specified.

34,994.—Allen Walton, of Philadelphia, Pa., for Improvement in Apparatus for Mixing Gases:

I claim combining a chamber, or reservoir, A, with Cutchett's Patent Gas Meter, the said chamber being so situated that both the air and gas must pass into and be mixed intimately together, in the said chamber, prior to escaping to the distributing pipes.

35,010.—C. P. Brockett, of New Haven, Conn., for Improved Lamp Burner:

I claim, first, The plate, F, with cone, G, attached, pivoted to the plate, E, at the top of the burner, provided with a catch, H, and arranged relatively with the wick tube, B, to admit of the plate, F, with chimney attached, being shoved off from and on the burner, for the purpose specified.

Second, The tube stopper, h, attached to the under side of the plate, F, in combination with the cross bar, I, secured to the plate E, and in such relation with plate, F, and cone, G, as to elevate plate, F, and stopper, h, and admit of said stopper being raised out of and fitted in tube, C, by the movement of plate F, as set forth.

Third, The tube, C, fitted in the burner, A, in connection with the movable plate, F, arranged substantially as shown, to cover the tube when the burner is in use and the lamp lighted, and to expose the tube for filling the lamp when the plate, F, is shoved off from the burner.

35,013.—W. R. Cunningham, of Brooklyn, Ohio, for Improvement in Water Elevators:

I claim the self-regulating brake, composed of the spring, 8 8 8 the sliding journal box, 7, the rubber, 11, used in connection with the friction flange, 10, the whole being constructed substantially in the manner and for the purpose specified.

35,039.—Susan D. Pinkham, of Fond du Lac, Wis., for Ventilator for Petrol Oil Lamps:

I claim the combination of the curved tube, inverted cup or disc, with a lamp, substantially in the manner and for the purpose set forth.

35,054.—W. E. Worthen, of New York City, for Improved Faucet:

I claim, first, The combination with the plug, of a faucet of locking pistons, vibrating in lines perpendicular to the plug, the combination being substantially as specified, and the pistons being arranged on the faucet as set forth.

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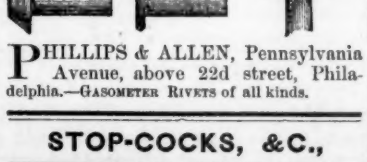

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PATENT-OFFICE NOTICES.

United States Patent-Office,
Washington, April 17, 1862.

ON THE PETITION OF PHEBE Ann Fisk, Executrix, &c., of Almond D. Fisk, late of the City, County, and State of New York, praying for the extension of a Patent granted to the late Almond D. Fisk, Nov. 14, 1848, and re-issued March 6, 1860, for an improvement in Coffins, for seven years from the expiration of said Patent, which takes place on the 14th day of November, 1862.

It is ordered that the said petition be heard at the Patent-Office on Monday, the 27th of October next, at 12 o'clock m.; and all persons are notified to appear and show cause, if any they have, why said petition ought not to be granted.

Persons opposing the extension are required to file in the Patent-Office their objections specially set forth in writing at least twenty days before the day of hearing; all testimony filed by either party to be used at the said hearing must be taken and transmitted in accordance with the rules of the office, which will be furnished on application.

The testimony in the case will be closed on the 13th of October next; depositons and other papers relied upon as testimony, must be filed in the office on or before the morning of that day; the arguments, if any, within ten days thereafter.

Ordered, also, that this notice be published in the "National Republican," Washington, D. C., and "Tribune," New York, N. Y., once a week for three successive weeks; the first of said publications to be at least sixty days previous to the day of hearing. D. P. HOLLOWAY,
Commissioner of Patents.

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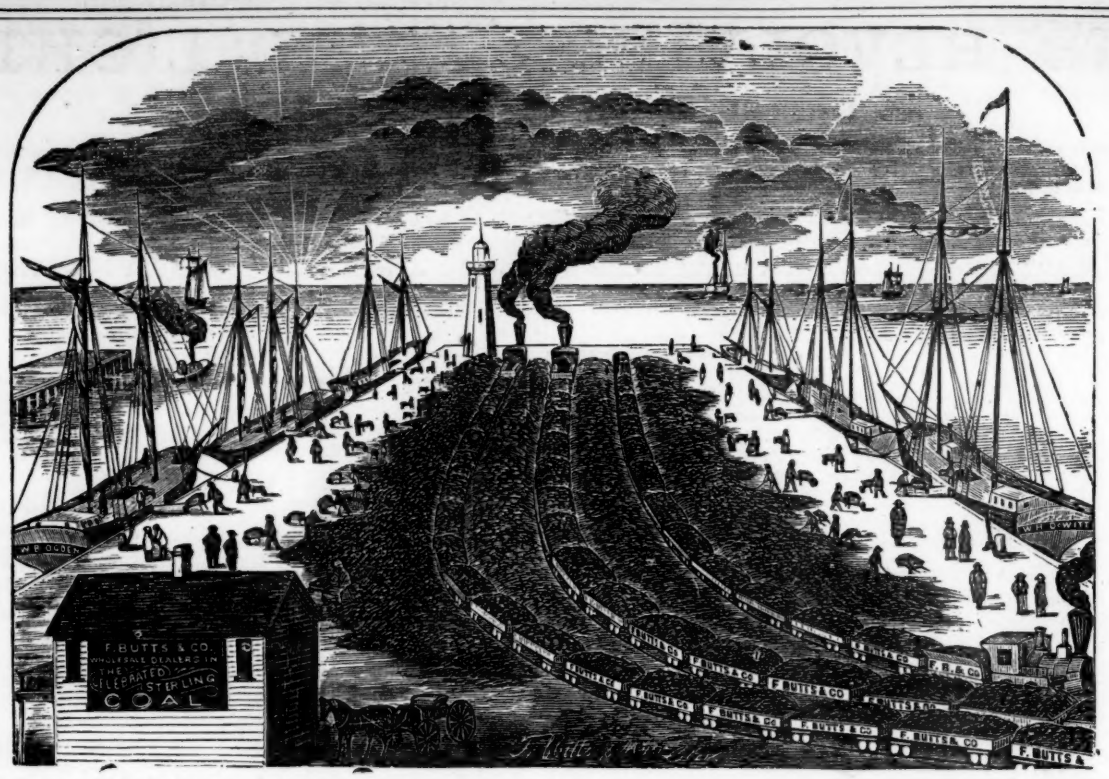
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POTTS' REVOLVING SIGNAL LIGHTS,

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Mr. ALBERT POTTS, the well known Inventor of the LAMP POST LETTER BOXES, which have been adopted by the Post-Office Department for the large cities of the United States—and also of the GAS METER BOX, to be set in the front walls of houses, thus doing away with visits from Gas Inspectors, or burglars in gas-clothing, has lately brought forward a third Invention, which in point of importance and world-wide usefulness, surpasses the others entirely.

These SIGNAL LIGHTS are intended for use on Vessels propelled by Steam, and those exclusively. They specially indicate the presence of a Steamer, and by their use, there will be less likelihood of mistakes, and consequent collision than at present. They are also intended for SIGNALLING AT NIGHT, and can be used for that purpose UNDER ANY CODE of SIGNALS NOW ARRANGED FOR FLAGS.

This Improvement in Lights for Steam Vessels, consists in having the Lanterns containing the colored lights, connected by means of a series of cogged gearing with some convenient part of the Engine or Machinery, so as to cause them to have a revolving motion around their axis. On side wheel steamers, the Lanterns should be placed directly over the wheel-houses, and the power, or motion to turn them, may then be very conveniently obtained from the paddle wheel shaft. On Propellers, the Lanterns should be placed on each side of the Pilot House, or hurricane deck, and the rotary motion derived from any convenient or suitable part of the Engine or Propeller Shaft. Each Lantern is supported on the end of movable cranes, so that their relative positions may be changed and properly adjusted to suit the view of observers on either side of the vessel at the time of signalling.

The Lanterns to be used in this improvement may be constructed for Burning Oils, Fluids, Gas, or any of the known modes of illumination, and should be furnished with one or more lenses and reflectors, so as to concentrate the rays of light, and project them over the horizon with the greatest intensity. The lenses for this purpose should be made with colored glass, viz., Red and Green, and the position of the respective Lanterns, according to the color of the lenses therein, must be placed on the sides of the vessel so as to answer to the requirements of Rules and Regulations made and published by the Supervising Inspectors of Steamboats, agreeably to the Act of Congress of the United States in such cases made and provided. That is to say—by said Regulation—the Lantern having the green lenses for producing the Green Colored Light, must be placed on the starboard side of the vessel, and the other Lantern producing the Red Light, to be placed on the port side thereof In pursuance, also, of the aforesaid Rules and Regulations, there is to be found in board and behind each Lantern, a screen to answer the purposes therein mentioned.

The cogged gearing, by which the Lanterns are connected with the Engine or paddle wheel shaft, and thereby caused to revolve when the Engine is in motion, is so arranged that the connection may be readily shipped or unshipped, and the lanterns made stationary or otherwise, at the pleasure of the Pilot, or those whose duty it may be to operate and attend to the same. The cranes on which the Lanterns are placed, are also rigged so as to be readily turned horizontally from one position to another, so as to present one or both lights to the view of observers when laying athwart ships at the time of signalling.

On the Use and Application of the Improvement for Night Signals.

When the vessel is under weigh, or going ahead in its course, the Lanterns are to be placed directly athwart ships, so that such colored light therein will then have the position and place prescribed by Rule Seventh of the aforesaid Supervising Inspectors of Steam Boats, and with the screens behind them, as above described, will then answer all the intents and purposes for which the colored lights are thus required to be used, as illustrated in the several diagrams published by said Inspectors for the working of a system of Colored Lights. The Lights in this case, according to the color seen by the observer, indicate the course or direction of the vessel whereon they are carried. When the Lanterns with the colored lights therein, are made to revolve around on their axis, as proposed in this improvement, in addition to the signal above, another, and as we believe, very important and useful signal is thus formed, indicating that the vessel, whereon it is carried is a Steamer. In dark foggy nights, it is found by experience, to be somewhat of a difficult task to distinguish sailing vessels from Steamers and Propellers, especially when the latter are rigged, and carry a press of sail. When Steamers meet "head and head," it is the duty of each to pass to the right, or, on the larboard side of the other. Whereas, when a Steamer meets a sailing vessel, the former must give way and allow the latter to pursue its course. Hence, to carry out the regulations of the said Steamboat Inspectors, and prevent collisions, it is important to have some infallible sign, whereby the character of the vessel may be readily seen and determined. Several very fatal collisions have recently taken place through mistakes of this kind.

On Signals for Speed and Distance.

The gearing of the Lanterns with the paddle wheel or propeller shaft, may be so arranged as to be an index of their speed A very good proportion, would probably be to make the Laterns turn about one third as fast as said shaft. Hence, when the speed of the vessel is previously known, when making a certain number of revolutions of the paddle or propeller, it becomes an easy task from observing the time with which the Lanterns thereon may be turning to approximate to the speed with which the said vessel is moving at the time of observation. Again, as the area described by the rays of light from each lantern, as they revolve around on their axis, is greater in proportion to the distance from said lantern, so will the time in which said rays move over any given space, be less in the same proportion. Hence, when the lights are very remote, or far off, from the observer, the duration of each column or cylinder, of rays from each lense, would pass the eye of the observer, in a short space of time, or with great velocity. Whereas, at a nearer point of observation, the time of its passage would be considerably lengthened, or the motion thereof apparently much slower. From these facts, we believe the improvement is susceptible of indicating, in an approximate manner, the speed and distance of vessels whereon the revolving lights may be used.

On the Application of the Improvement for Marine Telegraphic Purposes.

The Revolving Lights can be readily applied to the general purposes of Marine Signalling at night, as follows: In order to show this application, we have adopted the Numbers as given in Roger's Code of Marine Day Signals, believing that work to be somewhat of a standard in matters of this kind. Instead of the flags used in the above code, for day signals, to indicate the combinations of two or more letters of the Alphabet, which combination is referable to certain numbers indicative of the words or sentences telegraphed, we propose to perform the same operation, at night, by means of the two revolving colored lights, so as to indicate the numbers directly to which the intended words or sentences to be telegraphed are referable. Thus, whether the vessel to be signalled is ahead, astern, or abaft the beam, the position of the two colored lights must be so adjusted, by means of the moveable cranes, whereon said lanterns or lights are fixed, that the two lights may be fully made visible to the observer. When both lights are thrown into this position, stopping the motion of the lanterns may be the signal for calling attention, or a rocket fired off, or the steam whistle blown, would answer the same purpose. Now, in order to represent the ten numerals, we propose to indicate them by the respective motions of the two colored lights, as follows:

RED LIGHT.	GREEN LIGHT.
One Red, Represents Number 1.	Two Green, Represents Number 2.
Three do. do. do. 3.	Four do. do. do. 4.
Five do. do. do. 5.	Six do. do do. 6.
Seven do. do. do. 7.	Eight do. do. do. 8.
Nine do. do. do. 9.	One do. do. do. 0.

In the above arrangement, it will be seen that all the odd numbers are made by the Red Light, and the even numbers by the Green Light. In order to indicate the repeat of the last number, once or more times, or for other special purposes, which may hereafter be found useful and necessary, an even number of lights may be shown by the Red, and an odd number by the Green. It will be understood that when the Lanterns are made with three lenses in them, the numerals as above arranged are formed by the number of times a new light or lense is presented to the observer. Thus to indicate the number 3, the Red Light or Lantern would make one entire revolution; and to make the number 6, the Lantern carrying the Green Light would make two revolutions, and so on with the other numbers. When a symbol is made, the motion of the Lantern is to be suspended for a short time, and when a number expressing a sentence is formed, the lantern may be stopped for a longer period, or some one of the special signals above referred to, may be used for this purpose.

To show the application of this improvement as above mentioned, whereby these Lights can be used as readily for Night Signals, as Flags are used for Day Signals by the author of Roger's Code, we shall use the sign O colored red or green, according to the light used, to show the number of movements performed by the respective lights in order to represent any desired number of said code, suitable for the required purpose.

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O,	
O, O, O, O, O, O, O.	
O, O.	
O. O.	

The above would represent the number 5722, and by reference to said Roger's Code, would be found to stand before the sentence:

"WILL YOU SHOW THE NUMBER THAT REPRESENTS YOUR NAME?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O.	
O, O, O, O, O, O, O.	
	O, O.

Here the number expressed is 1572, and per the same Code, stands for

"WHERE ARE YOU BOUND?"

RED LIGHT.	GREEN LIGHT.
O.	
O, O, O, O, O, O, O, O, O.	
O, O.	
O, O, O, O, O, O, O, O, O.	

The number thus expressed is 1928, and per said Code is

"WHAT IS YOUR CARGO?"

RED LIGHT.	GREEN LIGHT.
O, O, O, O, O.	
	O, O, O, O, O, O.
	O.
O, O, O.	

Here the number expressed is 5603, and stands for

"HAVE YOU ANY NEWS?"

(RED LIGHT.)

Fig. 2

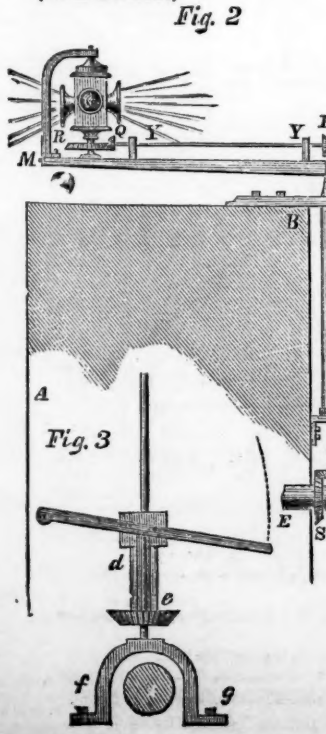

Fig. 3

(GREEN LIGHT)

Fig. 1

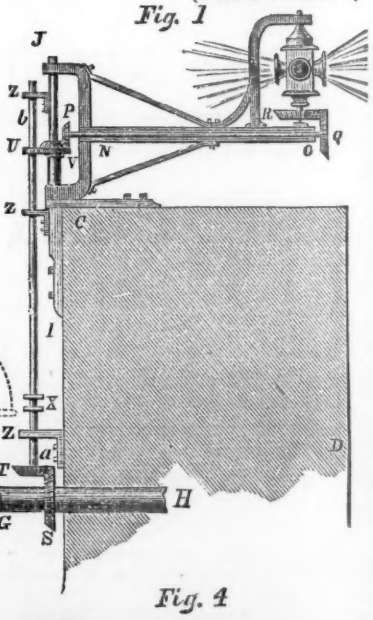

Fig. 4

MECHANICAL CONSTRUCTION.

In our engravings, Figs. 1 and 2, represent Vertical Sections through the wheel-house. In them E F and G H represent portions of the main Shaft. In Fig. 1, I J is a stout Iron or Wooden post, fastened against the side of the wheel-house, directly over the main shaft On the upper part of this post, is fitted the moveable arm or crane N O, to the main shaft is fitted the bevel wheel S, and to the lower end of the rod a b, is fitted a corresponding wheel T. U is a small pinion on a b, which gears with the spur wheel, V, which in turns gives motion to the wheels, P and Q, and so revolves the lamp R. It will be seen that a Rotary motion is given to the lamp, when the main shaft is in motion and a b connected.

It can be disconnected by a lever, acting between the bosses X, which will elevate the rod in the guides Z Z Z.

Fig. 2 is another arrangement, for the same purpose. In this, K L, represent a hollow Shaft, on which is firmly fastened, the arm L M, on which is the lantern. The hollow post is secured to the wheel-house by the straps K and B, and it can turn freely in them, the other part being the same in them as in fig. 1

The lever K W, when drawn down, will turn the frame in any required position around the Shaft c U. In fig. 1, the arm or crane N O, may be operated by cords from the wheel-house, but in this device, the rod c U. does not lift up as in fig. 1, but in its place, the lower end is made square, and on it slides the short tube, d E, shown in fig. 3. The lower end of the rod turns on a bridge, f g, spanning the main shaft. On the upper end of the tube, d e, a lever is attached by means of boxes and collars as shown in fig. 4. This lever when raised carries with it the beveled wheel T, thus disconnecting the gearing apparatus.

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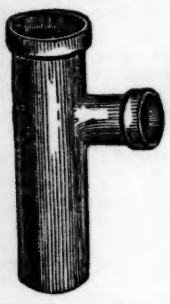

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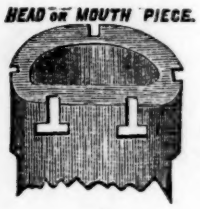

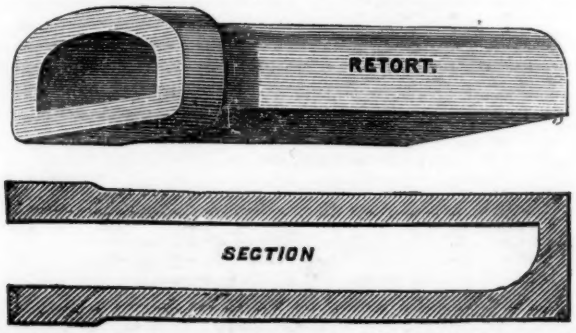

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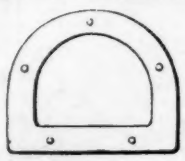

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